UNDERSTANDING ROADBLOCKS TO ADAPTING NEW TECHNOLOGIES

by

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Abstract

In today's fast-paced world of technology, new innovations are created constantly. Due to the prevalence of these new technologies being regularly introduced into workplaces, making the implementation easier for end-users will help ease the implementation process itself. This research focused on the relationship between University of Northern British Columbia (UNBC) employees and the implementation of the Banner 9 upgrade to UNBC's ERP, specifically by answering the following questions: how do UNBC Banner users feel about the implementation, what themes were prevalent in the implementation, and what suggestions and recommendations can be made to mitigate resistance and lessen the difficulty of future implementations? Surveys and interviews were used to collect data. Via participant responses, the following suggestions were derived from the themes discovered: hold regular and themed training workshops, increase transparency regarding the implementation, provide IT department demonstrations, and have documentation more accessible to users.

Keywords: technostress; technology use; technological implementation; qualitative research; case study

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Chapter 1: Introduction

As the inclusion of technology is becoming a necessity for workplaces to remain competitive worldwide (due to the efficiencies that technology can create), it is increasingly common for technology to be present in workplaces. This, in turn, causes new technologies' (or new versions of technologies') implementation rates to also be increased (Kakabadse, Kouzmin, & Kakabadse, 2017). The addition of technology (or new technology) to a workplace is classified as a change in the workplace, and just like any change in the workplace, implementations of technology in workplaces lead to struggles; with change comes resistance (Ford, Ford, & D'Amelio, 2008; Larson & Tompkins, 2008; Mahitthiburin & Boonkrong, 2015).

While it is normally not problematic for new employees to embrace innovation, resistance often occurs when long-time employees must change their routines by forgetting what has been ingrained into their workdays, and risk returning to a technical baseline with everyone else. Resistance in the workplace is detrimental as it wastes people-hours worked, creates stress for everyone involved, and can lower worker morale for the duration of the innovation and whenever future innovation may occur (Lazar, Jones, & Shneiderman, 2006). This resistance is not ideal, so what can be done to mitigate it?

One effect of new technologies entering workplaces is a group of negative stressors that users experience termed *technostress* (Berger, Romeo, Gidion, & Poyato, 2016; Joo, Lim, & Kim, 2016; Khan, Rehman, & Rehman, 2016; Salanova, 2013). These stressors can lead to high levels of anxiety, fatigue, skepticism, and inefficacy, all spurred on by the use, or expected use, of technology. Employee well-being is linked strongly to employee performance, and reducing stressors that negatively affect employee well-being helps

improve employee performance (Myrtveit, Jez, & Johansen, 2014). One can then surmise that in order to increase the success rate of a technological implementation, addressing resistance and removing technostressors are effective ways to do so.

Perceived usefulness (or uselessness) when it comes to adopting new technology is another factor in technology adoption (Mani & Chouk, 2017). Resistance to technology often occurs when perceived novelty and intrusiveness are high, and perceived convenience and ease of use are low, which further emphasizes the need of informing employees what benefits a new technological implementation provides for them and their institution, and the more detailed and catered to employees, the better. Addressing resistance as much as possible should be a goal of every technological implementation, as the disadvantages mentioned above are too numerous to ignore (Ford, Ford, & D'Amelio, 2008). This addressing can be accomplished in a multitude of ways, including by turning resistance into a learning opportunity, increasing exposure to users, and prevention (Laffey, 2004; Wegener, Petty, Smoak, & Fabrigar, 2004).

Research at Carnegie Melon University regarding Two-Factor Authentication being made mandatory demonstrates some valuable lessons when it comes to adopting new technology (Colnago et al., 2018). Employees should be provided with documentation that they know how to find, is pertinent to them, and is easily accessible; employees should be made aware of any implementations' benefits to them, their processes, and the institution; employees should also be made aware of the reason for the upgrade in a way that is understandable to them and what any new features or changes will be; and that adoption of technology should be required by all users, and not on a voluntary basis. Employees that do not know how to use the new implementation will not be able to perform their tasks

adequately, or at least not an optimal fashion. Employees that are unsure of why an implementation is occurring or what the upgrade is for tend to be annoyed by the process and can have a negative opinion of it the whole way through. Employees who are forced to adopt technology do tend to view the process more negatively, but the incidence of employees finding changes less intimidating than expected offsets the risk of their viewing the process as a negative one.

To look at a real-world example of technostress in the workplace, this research examined the resistance that comes with an implementation of a new version of software in a post-secondary institution. The University of Northern British Columbia (UNBC) previously used Banner 8.1.3, an Oracle-client-based system, for its Enterprise Resource Planning software, which assists its users to organize and manage various departments of the university (not limited to Finance, Human Resources, Advancement, and the Office of the Registrar, with Human Resources and the Office of the Registrar being excluded from the potential participants of this study). In July 2018, UNBC began its move to Banner 9.X, which is web-based, and has a significantly different user interface. Professional opinions from the Office of the Registrar's Banner consultant as well as UNBC's IT department expected this new interface to bring about a lot of frustration and difficulty in its implementation, due to how radically different it was to navigate. This kind of frustration can lead to lower productivity, lower quality of service, and even staff turnover (Lazar et al., 2006), but by identifying what aspects of the upgrade's implementation are causing issues with adaptation, one can begin to remedy this problem. By using a reflective approach to troubleshooting, employees were responsible for their own training to ensure any of their apprehensions were addressed or removed regarding the upgrade to continue in their daily

tasks without interruption. A common finding amongst participants was that employees were split into two camps, with which camp they ended up in unsurprisingly linked to their attitude toward the upgrade and self-reported level of technological skills. Those who reported lower technological skills and who did not have a positive attitude toward the upgrade did not prepare themselves for nor commit to the upgrade. These employees struggled with the upgrade and viewed it as a chore to work through. Employees who had reported higher technological skills took initiative in finding or creating documentation to assist with the switchover and viewed the upgrade as an opportunity to learn new ways of doing things and search for even more efficiencies in process. By having employees involved in the process of optimizing how they use technology to assist them (as well as creating the documentation), they can approach self-actualization through empowerment. (Benson & Dundis, 2003). As well, employees feel more committed to their jobs when they feel empowered (Maslow, 2000). Employee empowerment not only increases employee commitment to an organization, but can also significantly increases performance, teamwork, autonomy, and satisfaction (Hanaysha, 2016). Employee voice (when employees are allowed to provide feedback to management regarding workplace processes) is a facet of employee empowerment that is crucial for well-being and satisfaction in the workplace (Avey, Wernsing, Palanski, 2012). Giving employees the increased autonomy in approaching technological implementations in their own way and also opening channels for discussion with them to provide and receive feedback is thus a worthwhile endeavour.

The purpose of this research was to provide information on how best to address employee resistance by highlighting their concerns and identifying areas that could increase their willingness to accept change. By addressing these employee concerns (technostressors),

employee well-being could be improved, employee empowerment could be increased, employee voice could be acknowledged, and the autonomy that results significantly increases the chances of positive and successful technological implementation (Beabout & Carr-Chellman, 2008; Myrtveit, Jez, & Johansen, 2014).

Researcher Context

Growing up, I was the first among my peers to have access to computers and various forms of communication technology, including the Internet. I would spend many hours of the day "plugged in," and would often have to be coaxed into playing outside. The freedom of being able to play with computers and technology as my sandbox (metaphorically, and in lieu of) from a young age unquestionably helped in my being comfortable with technology. Whenever new technology would be released to consumers (I vividly and embarrassingly remember saying "100 MB on one disk? I'll never need more storage than that!" when Zip disks came out), I would be eager to try them out and adopt them, as they typically made things easier to do (having a hard drive that stored data over cycling floppy disks is great). In addition, I personally identify as a futurist, and one of my greatest fears is to be left behind by technology. Just as there is the problem of people resisting technology today, this problem will continue at an even more accelerated rate to match the increase in innovation. To avoid this, I am very interested in the research area of adoption of new technologies: figuring out what hinders this adoption and figuring out what helps it can make the process more seamless and efficient and may open people's eyes to adopting optional new technologies when they would not consider it before.

I had been a staff member of the University of Northern British Columbia's Office of the Registrar for over four years. I worked as a student employee at UNBC for three years

prior to this. I also completed my undergraduate degree at UNBC and am currently completing my Master of Education – Multidisciplinary Leadership graduate degree. While I was not born or raised in Prince George, completing my undergraduate degree at the university and getting to know the UNBC community really encouraged me to stay at the university long enough to place the foundation of my career. It is due to this long-term association with UNBC that I am largely invested in the university's success and can see how processes affect students from both sides of the process. While having a more "connected" university with more seamless processes is a clear benefit to students' accessibility, increasing the quality of life for staff members at the university is an additional goal of this research.

The Banner 9 upgrade was a topic of concern for many employees of UNBC. It was well-discussed in the post-secondary community for being radically different in appearance and a significant point of contention and difficulty for a lot of veterans in the industry. Many staff members repeatedly expressed their repugnance for the upgrade, stating concerns such as not having any time to deal with the upgrade, as they are already overworked and behind in their everyday tasks. When the testing environment was first opened up to staff, a lot of the staff simply looked at it once, and then went back to what was familiar to them. Someone had casually mentioned to me that working through these difficulties with staff is a job that consultants typically get, and it was at that point that I wondered why there is so much resistance to (what should be) a welcome thing that occasionally specialists are hired to assist with implementation.

Background to the Study

This study took place at a small research-intensive university that was established in 1990, has approximately 4600 students enrolled, and is located in a northern Canadian city of approximately 79,000. As this is a smaller, younger institution, resources and staff are limited for an undertaking of this size. The upgrade was rumoured to be approaching for a few years before any Banner 9 environment was available, or before this study was even a consideration. Even at that point, employees and managers were expressing concern over the "drastic" changes that would occur with the new version of Banner. As it was known that Banner would move from being Java-based to web-based, a lot of processes that were linked to the Java-side were expected to be overhauled, which was going to be a huge undertaking not just infrastructurally, but also regarding retraining. A large majority of the university's Banner users are employees who have been at the institution long-term: the familiarity with the way "things have always been" led to some skepticism among employees of the change.

My position at the university at the time involved working heavily with Banner, and I had created a lot of Banner-related process documentation and performed a lot of Banner testing and troubleshooting in my time in the Office of the Registrar. One of our major Banner experts left the institution shortly before the Banner 9 project was beginning, and a consultant who was hired to assist (who was a Banner expert) also mentioned how intimidating the switch over to Banner 9 was going to be, especially for an institution like ours. It was at this point that I realized that this would be an ideal event to study, as I immediately went to thinking ways to mitigate the changeover. I believe that one of the reasons that I received a high participant response-rate was because Banner changing so

significantly was not something that has happened before, so it produced a strong reaction from many employees.

The implementation of technology in an institution is necessary for it to keep current. Tipton (2002) defined the *Digital Divide* as the separation of those who have instant access to information, direct contact with others, and all the other benefits that being "online" provides, versus those who are not connected. While this divide is referring mostly to businesses who use the Internet versus those who do not, the implementation of Internet services is a very prevalent technology. As Internet and technology use is rapidly increasing amongst all age groups (Friemel, 2016), the expectation that a business is connected (both online and with current technologies) is a critical factor for its success: it has long been known that businesses that are not technology adopters experience reduced profits when compared against business that do adopt new technologies (Stoneman & Kwon, 1996).

The implementation of technology in a business or institution typically does not just occur by installing hardware or software, as the employees in that business or institution need to be equipped to functionally use that new technology as well. If employees are unable to use the technology, its existence does not provide any benefit, as its use is not being implemented. One might think the simple solution to this problem is to offer training to employees to get them to learn how to use a new technology's implementation. Training employees how to use specific technologies can work to get them to learn technologies, but if there is resistance to technology present in the workplace, getting employees to use them might not be a straightforward task. In addition, if the resistance is not addressed, the same struggle of trying to win employees over to the new technology will occur again the next

time an implementation takes place (whether it is an entire new implementation or just an upgrade to existing technology).

Unsurprisingly, when employees are stressed out and overworked, they suffer increased rates of ill-health outcomes and become over-committed and unable to withdraw from their work (Eddy, Heckenberg, Wertheim, Kent, & Wright, 2016). The model used by Eddy et al. specifically measures effort-reward imbalance to predict workplace behaviours, such as absenteeism, and ill-health outcomes, such as depression and heart disease. Their study used a ratio calculated from an employee's perceived efforts and rewards. If an employee does not feel that a new technological implementation is worth the reward, that workplace-stressor could even have detrimental health effects! As well, technostress-related stressors are directly linked with reduced job satisfaction, and technostress-related inhibitors (the opposite of a stressor) is directly related to increased job satisfaction (Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008). Technostress is clearly a danger to preserving employee commitment and well-being.

A very important finding regarding technostress is that one's level of technological knowledge or the presence of institutional support does not directly significantly influence intention to use technology: only lowered levels of technostress lead to a more positive intention to use technology (Joo, Lim, & Kim, 2016). Due to this, lowering technostress should be key to reduce all the negative consequences that come with technostress. Discovering what themes exist in employees' apprehension to technology and addressing them proactively can assist senior employees to reduce technostress. In addition, future employees whose first technological implementation experience is a smooth one (due to the

identified negative themes being pre-emptively addressed) have reduced levels of technostress when future implementations occur.

This present research reinforced some of the research findings discussed in the next chapter. One of the key findings of this research was that participants placed a high emphasis on personalization of their technology, but not for the reason that was expected based on the literature. Greater transparency regarding the Banner 9 implementation was also desired, but not just for participants understanding the reasoning for the implementation. Improved accessibility to documentation and training were also requested, as an unexpected barrier was discovered when it came to participants trying to access the Banner 9 documentation. These findings, as well as recommendations to address them, are elaborated on in the Results chapter.

Research Focus

The focus of the research was on how to implement the adoption of technology in an integrative way to minimize any loss of productivity that may result from the Banner upgrade. The Banner 9.X rollout was approved to be implemented in July 2018, with its full rollout occurring in February 2019. By identifying potential apprehensions before a rollout begins and creating possible exercises and training plans beforehand, familiarity can be increased with an upgrade as soon as it goes live. As the implementation occurs, more information can be gathered regarding any stumbling areas, and using that information, more assistance can be delivered in response to help successful implementation. With the data from this research, themes were identified that can be addressed in documentation and training plans for both this upgrade, and any future technological implementation.

Research Question

The research question of this thesis was: "What common themes are present in UNBC when it comes to resisting adaptation to new technology, and what methods can be used to mitigate these issues?" As there was marked apprehension surrounding the Banner 9 upgrade, there is cause for concern: what had caused the wary attitude that affected so many employees? Some employees had dreaded the upgrade to the extent that they had procrastinated entering the new environment until the old environment was no longer accessible. This fear not only increased stress-levels in individuals who were not looking forward to the upgrade, but also impacted their workload, and even their attitude toward the institution. If this kind of situation occurs regularly when new technology is implemented, addressing voiced employee concerns will have a significant impact on employee satisfaction. Not only will employees be further encouraged to offer suggestions for improvement that can increase productivity and job satisfaction, but they will be more likely to stay at the institution (Avey, Wernsing, & Palanski, 2012). Selected from the population of Banner users at this institution, quantitative questions were used to identify which participants would likely provide the most data. Following up these identified participants with qualitative interviews provided information on what technostress-related themes exist at the university, and individualized feedback provided data on what methods would be most effective in mitigating these issues.

Research Rationale

The web-based version of Banner is significantly different from the current Oracle-based version. While navigation in the Oracle-based version is largely performed by keyboard commands and typing in form names, the web-based version is largely using the

mouse and drop-down menus. As this interface is radically different, adaptation required constant attention to processes, as well as an updating of a majority of the technical documentation. This refresh of thinking required a thorough understanding of processes, as well as the ability to perform these tasks. This opportunity of "starting fresh" with documenting the technical process was a good opportunity to directly lead to refinement of these processes via optimization.

Not only is the addressing of employee concerns positive in terms of worker satisfaction (and therefore performance), simply the act of asking employees for feedback tends to significantly increase their attitude and view toward management (Sim, 2018). With the identification of certain themes, questions can be curated to regularly hand out to employees (with tweaking for each round when new information is gathered), and this alone can increase employees' willingness to adapt to new technologies. Two major reported reasons that employees did not participate in institutional improvement projects were that they did not have opportunities to participate, and did not feel that they had enough information on the topic to participate meaningfully (Jurburg, Viles, Tanco, Mateo, & Lleó, 2016). This study provided an opportunity for employees to give feedback and assured them that no amount of knowledge is a prerequisite for participation when giving feedback: this fact alone had an immediate tangible benefit independent from the findings that were reported from the interviews.

Research Significance

Successful adaptation of the Banner upgrade can lead to other technological adaptations at the studied institution following suit. The techniques and themes identified will likely be recurring when new technology is introduced: if there are already strategies in

place to mitigate any time lost, the technologies will be able to be adapted to at a quicker rate, saving resources in the form of people-hours. This increase in efficiency will likely increase retention as well as recruitment (when staff feels empowered by their technology, morale is higher), and in addition could lead to improved metrics, which could be used to identify any areas that require further improvement or require overhaul (or what new processes need to be created). The main goal of this research was to identify themes that are present at this university when it comes to resisting adaptation to new technology, and what methods could be used to mitigate these issues. With the identified themes from this research, processes could be implemented to address these concerns, future implementations could occur in a more streamlined fashion, and other workplace processes could be optimized. In addition, the research conducted contributed to the larger body of professional literature regarding technostress and technological implementation in the workplace, and more specifically to technical key elements and areas of concern when employees are tasked with using new versions of software.

Research can be expanded upon by performing research in other institutions and focusing in on the identified themes. Based on this institution's participation, there was a higher rate of participation for the survey than the interview. Due to this, researchers could create survey questions that reflect the themes identified in this research to identify which areas they could focus on more specifically in order to identify what the highest priority areas are to address in their own institutions. As the studied university has over 400 non-academic staff members, there is a likelihood that other workplaces will have similar themes when it comes to technostress, so other institutions and businesses could also benefit from the themes and concerns identified when they implement their own technological solutions. This

research's data could also be included in any future measures that may be created later on when examining technostress.

Thesis Overview

This research identified restrictions and hesitations with the new Banner upgrade and evaluated the process (of the implementation) both along the way and after the implementation was completed. To set the stage for the research, it is important to note the concepts extracted from the literature, in the form of the literature review in the next chapter: defining key terms such as technostress, the use of cybernetics to make a reflective process helping in collection of the data, identifying participants and stressors, the UTAUT and other models that focus on participants to those who provide rich data, and understanding the reasons for resistance to change and change agentry to frame the assistance that should be provided to the identified methods and themes when it comes to the adopting technology.

The third chapter of the thesis outlines the research methodology. In particular, it lays out the limitations of the study, ethical considerations and challenges with the Research Ethics Board, an outline of the selection criteria for participants, and sections on data collection and data analysis. The data collection section encompasses the research design, how the study was originally planned to be performed, and how the study ended up being performed. The data analysis section includes the how the data was collected and organized, and the reasons for doing so.

The Results chapter lists the objective results of the study, answers the research question, and provides a detailed analysis of the results. As there is both quantitative and qualitative data that has been collected for this study, there is an analysis of each data collection method individually, and then analysis with all data sets together. The analysis is

followed by discussion highlighting the findings and how the results support and extend the existing literature, some of which is included in the second chapter of this thesis.

The final chapter of the thesis consists of the conclusion. This summarizes the research, including all findings, lessons learned as a researcher, limitations, further direction for this research to head in, and how this research can be used practically.

Chapter 2: Literature Review

The literature reviewed for this project was a combination of the theory behind implementing new processes using technology, as well as some practical examples and the findings that they reported afterward. Technostress-related literature is a focus of the literature review, as that is the key area of focus in this research, along with technology-related institution-wide implementation strategies.

The literature review will begin with a definition of technostress and related terms, and how they are pervasive in technological implementation and adoption. Birnbaum's seminal work focused on a fictional institution in which faculty and administration work together to further the goals of the institution and describes many theories and practices, such as cybernetics, that can be applied in the real world to assist with co-operation. As well, Engelbart with his real-world institution adapted the term bootstrapping when it comes to improving processes, easily defined as the improving of improving processes. Before performing any research into technostress, it is important to ensure that the research is being conducted properly regarding participants and what aspects of technostress are to be examined. The Unified Theory of Acceptance and Use of Technology (UTAUT) described what had been found to be determinants in rate of technology adoption and was extremely useful in potentially identifying participants who may be good sources of data. The Diffusion of Innovation theories are important as they give strategies to help increase adoption, as well as cautions of areas to be wary of when implementing new innovations. Customization is a very important topic that regularly comes up in the research, and the ability to personalize aspects of new technology provides a sense of ownership that gives a huge boost to adoption rates. Resistance to change is what is causing this problem of lost productivity and possible

missed opportunities, so it is also important to understand why these notions exist, to resolve them. Another key term related to resistance to change is change agentry: the act of facilitating change (Beabout & Carr-Chellman, 2008). Finally, the Lean Six Sigma strategy will be examined and its relation to technological implementations in a post-secondary environment will be considered.

The concept of technostress and its relationship to implementing new technologies is a field that highlights many key areas to consider: both when looking for ways to increase adoption as well as ways to mitigate rejection. It is very applicable to post-secondary environments and is especially effective when combined with the concepts provided by technological adoption models, research on resistance to change, and change agentry.

Technostress

Technostress has been defined by many different authors in many different ways, including: stress related to the use or "threat" of use of in the (near-)future; high levels of anxiety, fatigue, skepticism, and inefficacy that results from technology use; and a compulsion to use technology, and the fatigue that results (Salanova, 2013). When participants received social support (assistance with their technology), they felt lowers levels of fatigue and exhaustion, but lower levels of efficacy resulted as they often felt they were unable to solve the problem on their own and that it could be also related to a sense of unfulfilled reciprocity to the person giving the assistance.

Khan, Rehman, and Rehman (2016) hypothesized that techno-overload and job satisfaction are related, that techno-invasion and job satisfaction are related, and that techno-uncertainty and job satisfaction are related. Techno-overload refers to the workers feeling overloaded by needing to learn too many information and communication technology (ICT)

skills, techno-invasion refers to the increasing use of technological methods and processes, and techno-uncertainty refers to workers being unsure if they are able to keep current with learning and updating themselves with regards to ICT. All three of the independent variables were shown to have negative effects on job satisfaction: the authors posited that it could be due to attitude towards adoption and lack of technical skill, as the results of this study show that techno-invasion was the weakest contributor to satisfaction levels.

Responses from a questionnaire sent to 294 administrative staff of the University of Barcelona measured four dimensions: ICT usage frequency, media skills, educational biography, and techno-stress related to ICT use (Berger, Romeo, Gidion, & Poyato, 2016). What they found was that certain types of ICT ended up producing more negative technostress-related outcomes than others, unsurprisingly, the least used and familiar ICT to the user was the one that caused the most technostress. What this tells us is that increased exposure to ICT (or new technologies and software) leads to decreased technostress. The researchers also noted that there can be specific events related to ICT use that are not necessarily results of participant behaviour (such as power outage or network connectivity problems) that can cause significant technostress and researchers need to be conscious of these occurrences when performing research relating to technostress.

An initiative has been put forth in South Korean schools where technology will have a much stronger presence in the classroom, such as physical textbooks being replaced by digital copies and the media-devices required to use them, with built-in functions such as dictionaries and workbooks. While this is less of a concern for incoming students, a major concern is the willingness of teachers to adopt the new technology implementation. Research using the technology acceptance model (TAM), stated that technostress had negative effect

on individuals' intention to use technology (Joo, Lim, & Kim, 2016). The results showed that the teachers' technological knowledge and level of school support influenced levels of technostress, which influences intention to use technology. This means that professional development and training programs to assist in technological adaptation will likely reduce levels of technostress and should be offered when new technology is being implemented. Interestingly, they also found that teachers' level of technological knowledge and school support did not directly significantly influence intention to use technology: it was only the lowered levels of technostress that led to an increased intention to use technology.

There also exists research which focused on the symptoms that result from technostress, and rather aims to alleviate those symptoms to lessen the negative impact of technostress-related outcomes (Myrtveit, Jez, & Johansen, 2014). Mindfulness-based stress reduction (MBSR), a clinical program with a self-regulatory approach to focus attention while distancing the related emotional reactions to a situation, has been found to lower stress-levels for employees in professional settings, which in turn lowers stress-related health problems for employees and increases the ability to minimize distractibility. MBSR showed positive effects for employees at all levels of technostress, with employees suffering the most stress benefiting the most from the intervention, and best of all, the effects are long-lasting (likely due to the combination of exposure mentioned above and the MBSR itself). These findings could encourage employers to offer MBSR sessions when implementing major technological implementations. By eliminating or minimizing the techno-invasion aspect of negative technostress, implementation can proceed smoother as employees' adjustment period may be minimized.

The concept of *ethopoeia* occurs when "people perceive computers as having human-like characteristics while…not believing that they are sentient and purposeful" (Charlton, Kappas, & Swiderska, 2015, p. 295). Computer anger is correlated with low self-efficacy and anxiety (Wilfong, 2006): characteristics of technostress, and ethopoeia does occur with regards to computer-related anger. The research suggested because anger at computers cannot be expressed to the "social partner" in the interaction, it is possible that it leads to a higher intensity of anger (as opposed to "gesturing" at other drivers). This expression, or feeling, of anger could lead to the negative-impact that new technological implementation can often cause.

Other noteworthy findings regarding technostress include non-executives having higher computer anxiety than executives, the more education that employees have being correlated with lower computer anxiety, and very interestingly, the longer that an employee's tenure, the lower their computer anxiety (Shah, Hassan, Embi, & Muhammad, 2011). While the last point in that list may indicate less computer anxiety in general, it is for a specific technological implementation that this research is focused on, and therefore the outcome may be different. It is still an important finding to note, however.

Cybernetics and Bootstrapping

Birnbaum (1988) is a well-known name in literature regarding implementing change in post-secondary institutions. He adapted the term *cybernetics*, regularly used referring to biological systems being improved by technology and applied it to organizations being improved by technology. In Birnbaum's example using his fictional Huxley College, he used an example of a salary equity problem to explain a *cybernetic loop*, a process in which the response is monitored, feedback given, and then a new response formed, until the process has

the highest-optimized outcome: there is an environmental change which leads to an organization's response, a sensing unit studies the important variable related to the environmental change and reports to a controlling unit whether or not the organization's response was adequate, and then the controlling unit issues a new organization response if necessary, repeating the process until the desired outcome is reached.

The Huxley College example for the *cybernetic loop* went through the following steps: the salary equity problem was identified, an affirmative action committee was created, but there was still a difference in salaries. The difference was discussed by the university senate, and then the senate communicated their displeasure to the president of the university who created a special salary adjustment policy. The senate determined this policy resolved the issue, and the president did not need to create a new organization response. Keeping this cybernetic feedback loop in mind, there is a way to evaluate the project and accommodate any issues that may come during its implementation.

The inventor of the computer mouse, Doug Engelbart, adapted the term bootstrapping (as in pulling oneself up from one's bootstraps) to refer to the process of improving upon improvements (Barnes, 1997). The key focus of Engelbart's philosophy was that humans can and will continue to improve exponentially as time goes on: to facilitate mankind's improvement and speed the process up, the processes that we use, as well as the tools that we use in these processes, must also be improved. When there is a process being examined for improvement, if there is a roadblock and no more optimization seems to be do-able toward the process itself, the tools that are being used in the process can be examined for improvement. This allows improvers to think outside of the box to potentially come up with novel solutions or future goals when not restricted by infrastructure (Engelbart & Engelbart,

1995). Another focus of Engelbart's work was that of collaboration and teamwork: those from different backgrounds and departments may have different approaches that have not been considered. As participants in this research all come from different departments, there is a variety of information and insight that may not have normally been obtained in the past when examining a technological adoption at this institution.

Participants and Stressors

The article *Design and Validation of Technology-Based Performance Assessments* (Baker, Chung, & Delacruz, 2008) outlined some criteria on which to measure validity: demands in the measure must represent the range and complexity that can exist in the area, the responses must represent the measure is looking for, the scoring must be consistent, scores should be able to be separated into categories (ex: low-high must equivocate to unskilled-skilled or similar), the participant must understand how to answer the questions, and that the measure's outcomes are not influenced by (non-measured) factors regarding the participants' backgrounds.

Howard (2011) identified that a large reason that some teachers may be hesitant in implementing technologies is that of risk. Howard explained that the perceived risk, the "possibility of unwanted events," exists because teachers may not have a high-level of confidence using new technologies (increasing the chance that things will not go according to plan), as well as the belief that deviating from traditional teaching methods does not seem appropriate in a classroom setting. Howard found that there were three key areas of concern: ability to problem-solve, availability of time, and perceived value of the technology. Teachers reported that they did not know what to do if something went awry with technology, as they do not have the ability or knowledge to troubleshoot. On the other hand, teachers that felt that

they could problem-solve when it came to technology did not perceive using new technology as a significant risk. Teachers also reported that they often already had their lesson plans and materials already prepared and having to implement technology would require them to create new material (which requires time to do). Related to this, many teachers who struggled thought that using technology in their classrooms did not add any benefit (and some even considered it to be less efficient that the traditional methods of using books, etc. that are already implemented). While teachers who used the technologies in their classrooms identified the same risks as those who did not, it was the teachers' negative perception of risk (spending time doing this work for little reward is not a good use of my time; if something goes wrong, I won't know what to do; and the value of using technology is negligible) directly influenced their willingness to use technology in the classroom.

Chowdhury (2015) aimed to observe difference in the rate of technological adoption by faculty between the two university campuses of the Daffodil International University in Dhanmondi, Dhaka, Bangladesh; but the researcher found that there was no significant difference between campuses in the variables they were measuring. The researcher explained possible reasons that they were unsuccessful in rejecting the null hypothesis, were that they had quite a low response rate and the university strongly encouraged technology-use in their campuses. It is important to ensure that possible participants are being evaluated on valid criteria so that valuable data is not missed in the selection process.

Research has also found that *technostress creators* reduced job satisfaction and *technostress inhibitors* increased job satisfaction, with many parallels to regular job satisfaction determinants: techno-uncertainty paralleled with role ambiguity, techno-overload

paralleled with role overload, and techno-complexity paralleled with task difficulty (Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008).

UTAUT

Technology adoption occurs best when both a top-down and bottom-up approach are used together, by obtaining and using feedback from the user level, as well (Williams, 2015). In addition, users of the technology also need to understand why the technology is being implemented for buy-in to occur: if the user thinks the "old system was just fine," they will likely have resentment to have to switch for what seems to be "no reason," as far as they are concerned. Venkatesh, Morris, Davis, & Davis (2003) formulated a model to assess how successful people might be in adopting new technology in the workplace to have solutions in place for when technology is implemented. To validate their model, the researchers compiled eight previously-established models that were successful determinants of likelihood of technology adoption. They applied these models to subjects from four organizations, and then took the similarities and findings from the research to come up with the Unified Theory of Acceptance and Use of Technology (UTAUT) model.

UTAUT is a model designed to assess what possible resistances may occur with employees adapting to new technology by taking in information about the demographics of the employees, the expected outcomes of the technology implementation, and the goals of the new technology implementation. Of these, an important determinant to note is that of Facilitating Conditions (see Figure 1), which contains such elements as computer anxiety, attitude toward new technology, computer skill, and comfort with using technology.

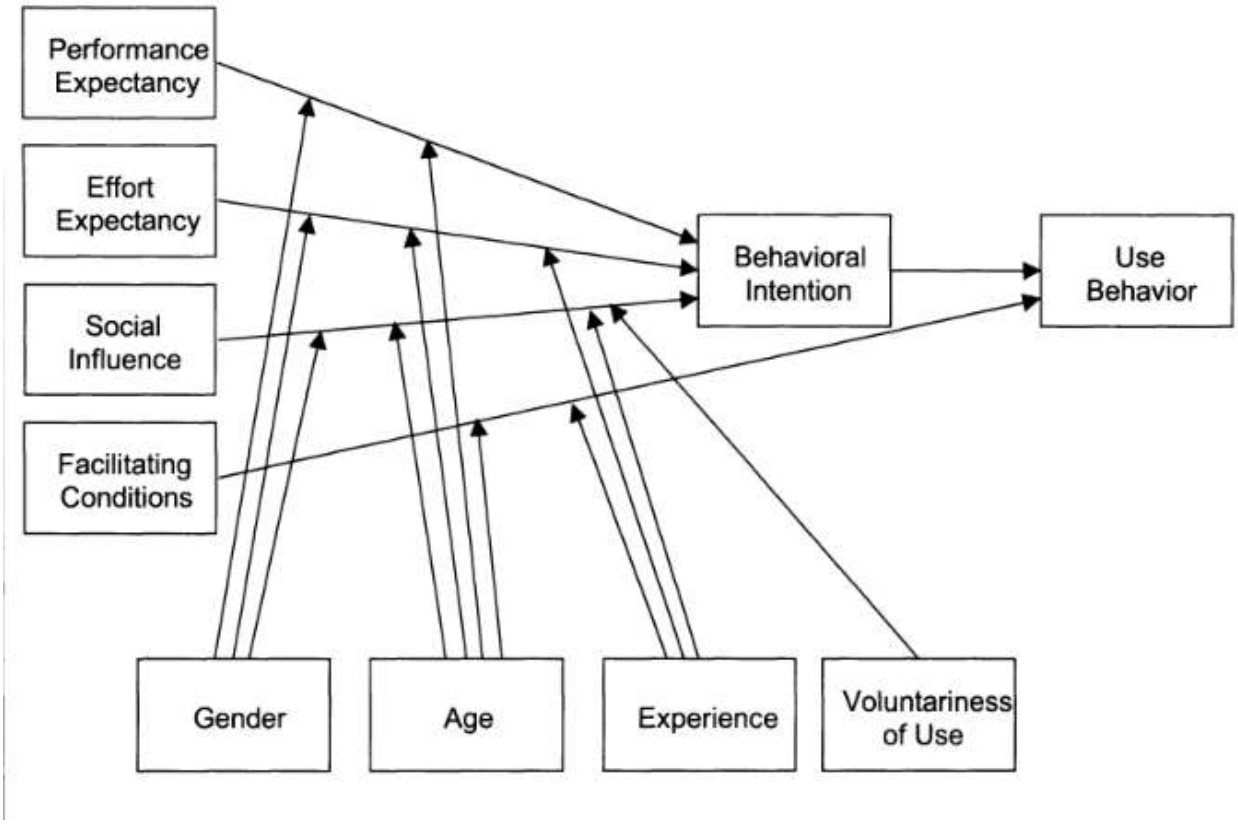

Figure 1. Unified Theory of Acceptance and Use of Technology Research Model. Reprinted from *User acceptance of information technology: Toward a unified view* (p. 447), by V. Venkatesh, M.G. Morris, G.B. Davis, & F.D. Davis, 2003, Minneapolis, MN: Management Information Systems Research Center. Copyright 2003 by MIS quarterly. Reprinted under fair-use.

The bottom of the UTAUT (Figure 1) lists four determinants that are strongly correlated with different levels of adapting to new technology: gender, age, experience, and voluntariness of using the new technology. To help identify possible participants that would be good candidates for the qualitative portion of the study, the previously listed will be covered by questions posed in the initial quantitative survey. Owen and Demb (2004) have identified that institutional culture is also a factor that can inhibit willingness to adapt to new technologies. Institutional culture cannot be changed directly (Fullan, 2007), but still is an

important factor to note when considering where potential resistance may come from, and can lead to the dangers of complacency, resignation, and cynicism (Ford, Ford, & McNamara, 2002).

Freimel (2016) reported that for older technology users, the most successful learning setting is a private, individualized one, as opposed to a professional course. As employees who fall into what is classified as an "older" age range on the UTAUT exist in many workplaces, it would be important to consider what kinds of training options are being offered to employees when considering new technological implementations. Further findings indicated that a reason that older individuals may be resistant to adapt new technologies has to do with public perception considering older individuals being not able to keep up with technology as acceptable. If the excuse of "being old" is no longer allowed as a reason to not use or adapt to new technologies, the rate of adoption amongst older people can increase. While there is not a lot that can be done by the employer about this situation, if those responsible for technological implementation and training are cognizant about it, they can take extra care when providing a personalized training session to older employees, emphasizing that they have the skills to and are required to adopt the new technology.

Diffusion of Innovation

Rogers (2010) introduced a theory known as Diffusion of Innovation Theory to explain the relevant factors at play when people decide to adopt new innovations. He defined innovation as "an idea, practice, or object perceived as new by an individual or other unit of adoption," and his theory focused on five factors regarding the innovation: advantages over existing solutions, compatibility with existing systems, complexity, testability, and observability. In addition, Rogers outlined some criticisms of previous implementation

theories, of which the following are important considerations when implementing new technologies to an institution: (1) When considering institution-wide implementations, it is emphasized that innovations need to be adopted institution-wide by every user (there should not be any users that stick with the previous pre-implementation technology), and that it needs to be adopted quickly; (2) If there are users struggling with adopting the new technology, there is a much higher chance that there is something wrong with the implementation versus something wrong with the individual user; and, (3) Feedback should be obtained from users as soon as possible, as users sometimes have difficulty remembering things accurately as time goes on (or their memories about certain aspects may change).

Rogers (2010) recommended some additional strategies to increase adoption of implementations, and that is through social networks. If there are users who are strong supporters of an implementation (and have no stake in the success of the implementation), it may be beneficial to give them a voice and make them an "opinion leader," someone who can influence others to become adopters by highlighting and supporting the positives of the implementation. Eventually, as rate of willing adoption increases, the institution will reach the "critical mass" of adoption, where those who have not adopted the technology are in the small minority, and all onboarding procedures will start new users off with the new technology.

An important part of diffusion of innovation theory to consider is the "innovation-decision process," see Figure 2 (Rogers, 2010).

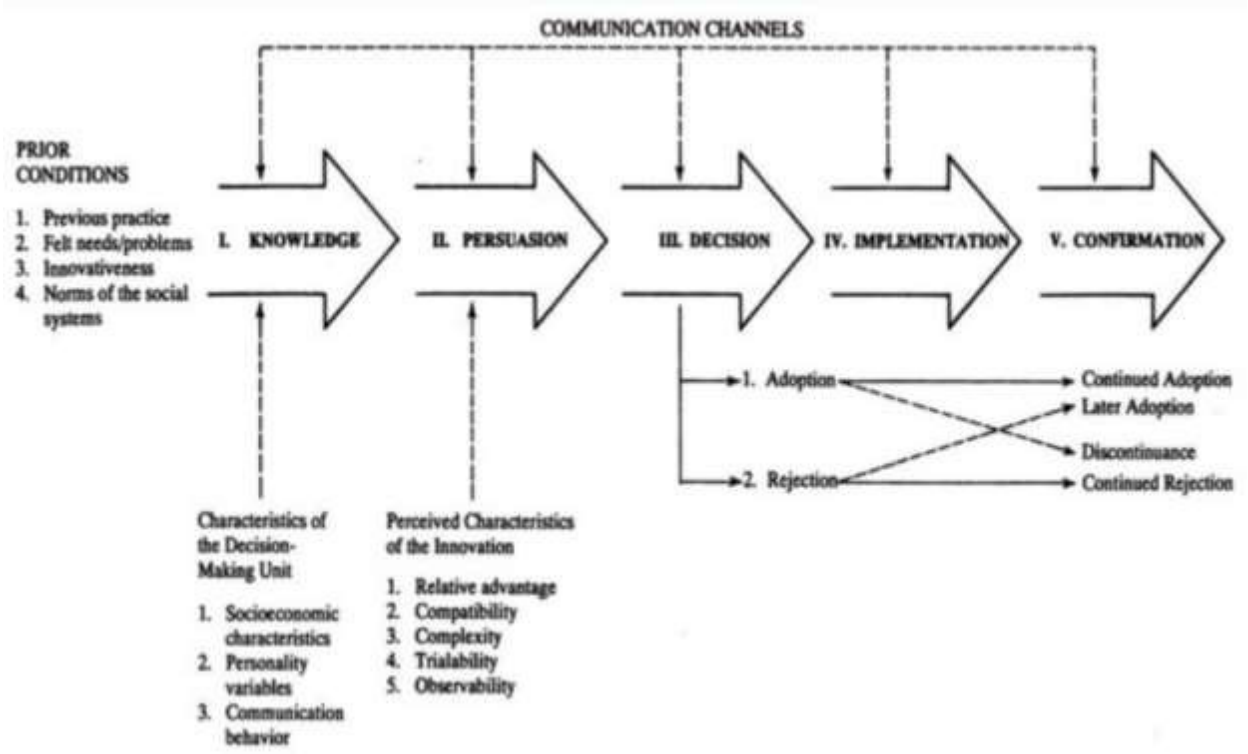

Figure 2. The Five Stages of the Innovation-Decision Process. Reprinted from *Diffusion of Innovations* (p. 41), by E. Rogers, 2010, New York City, NY. Copyright 2010 by Simon & Schuster. Reprinted under fair-use.

The first stage in the process, Knowledge, is when a user first hears of the technology and learns what it is supposed to do (in the implementation focused on in this research, it would be the first time a user hears about Banner 9, and that it is the successor to Banner 8). The second stage is of key importance to this research: Persuasion is when the user develops their positive or negative reaction to the technology. The third stage, Decision, is when the user adopts or rejects the implementation (in this research, they don't really have the option to reject it, as it is required to continue their work). Implementation is when users use the technology, and Confirmation is when they decide they were right in their initial opinion formed in the Persuasion stage, or they change their mind and reverse the opinion formed in the Persuasion stage. To increase the speed of adoption for an implementation, a quality that

can help is something Rogers called “re-invention,” which refers to the freedom a user has to personalize or use the technology in their own style. This appropriation of technology can cause the user to not only adopt the technology quicker, but also causes the new implementation to last longer, which can be attributed to the user’s pride in making the technology their own (Kirk, Swain, & Gaskin, 2015).

Personalization

The ability for a user to be able to customize an interface (i.e., personalize) is a powerful force when it comes to increasing rate of adoption with new technologies (Pierce, Kostova, & Dirks, 2002). It is shown to improve self-efficacy in relation to using the technology and give the user an increased feeling of identity. This feeling of ownership that results from personalization causes users to think of their instance of the technology as “theirs,” as opposed to the same thing everyone else has: when something belongs to the user, they are far less likely to critique it and instead focus on the positives.

Personalization also has the added benefit of users wanted to show others their personalizations out of pride (Pierce, Kostova, & Dirks, 2002). The importance of this is made clear when employees already using the new implementation encourage new users to begin using the new technology, and as the new user’s first experience with the new technology is personalization, they then get their own sense of ownership regarding the technology, and the cycle can repeat. Finally, it is very critical to note that taking away personalization options (or resetting them frequently) can lead to the loss of the feeling of ownership and can lead to a negative attitude toward the technology in some instances due to no emotional attachment. In Banner 8, users were able to personalize their interfaces by assigning colours to items such as bars and text of various areas in whatever combination

they had chosen. At the time of implementation, Banner 9 no longer had that functionality present. Another caution to note is that the personalization process should be relatively difficulty-free. If users are able to personalize the interface of the implementation to their liking, it boosts their confidence in their own skills, and enables them to test out the new implementation at a start-point of greater confidence. If they are unable to even perform the personalization, the demoralization that may occur could be devastating to adoption (Kirk, Swain, & Gaskin, 2015).

Resistance to Change

Resistance to change is always borne from something and can vary from user to user (Ford et al., 2008). Resistance can be born out of a perception of how a user envisions the task to be performed, and how it can be performed with the new technology: if the user's vision is radically different from the new technology, this difficulty that results from the dichotomy can cause a user to resist its adoption. External factors that contribute to one's resistance are previous technological implementations that broke agreements, lack of transparency, and almost paradoxically, resisting resistance (not allowing users to voice their concern or have a learning curve, which shows processing and evaluation). The goal should not just be to eliminate the resistance, but to address the reasons for it, turning it into a learning opportunity. It is important to note that an organization failing to adopt new technologies when its competitors do typically does lead to profit loss, regardless of other factors (Stoneman & Kwon, 1996).

Laffey (2004) posited that real, active experience with the new technology (as opposed to training exercises or demonstrations) helps lessen that gap between how it should and can be performed. By surveying approximately 300 students and 30 pre-service teachers,

Laffey formed focus groups to identify experiences that were similar and unique, and highlight instances where participants showed value or resisted the use of technology. What was found was often, when new technology is implemented, is that the users will begrudgingly use it in the setting they are familiar with but would never transfer that set of skills to another setting, due to concerns, lack of skill to do so, or just unwillingness to do so.

In their study, Larson and Tompkins (2005) stated that the more obtrusive control from management is, the increased the resistance (if management is making a very rigid and obvious change, people will respond less favourably). Compounding this, as managers might not have high enough communication skills, managers sometimes give out ambivalent communication, which leads to frustration of employees as they are uncertain of what they should prioritize (quality or efficiency). One common trap in many workplaces is they embellish their historic success based on specific values, and at the same time demand that these values are required to change to stay a leader in their industry. This ambivalence strongly demotivates employees, as either they can sense that the manager may not committed to part of the message, or they feel that the manager is too disconnected from the work and doesn't understand that doing both is impossible. When this happens, employees typically ignore the new directive and continue working as before, for as long as possible, and can even argue that the directive is nonsensical cherry-picking parts of it as evidence. The authors also found it important to stress that this can happen at all levels, so this outcome can even affect managers, which sends it down through the chain! When there is resistance to change, it is therefore important to look at the actual methods that the change is being communicated with: poor communication alone can directly lead to resistance, regardless of the actual change and intention of the communication.

In their chapter, Wegener, Petty, Smoak, and Fabrigar (2004) sought to explain how resistance forms in the workplace, so rather than countering it directly, it can just be avoided in the first place (prevention vs treatment). The authors described how people typically fall into one of two camps when faced with a choice: one that likes to weigh information from both options equally and fairly, and the other that more or less chooses one option and only critiques the shortcomings of the opposite option. The chapter continued to state that resistance can come about from defensiveness of whatever attitude/process is being changed, as in they take it personally when the way they used to do it isn't good anymore, as well as negative cues that can be unintentionally picked up while the change is being presented. One strategy the authors suggested is to inform people at the start of possible biases one can have: they have found that when people are aware of a bias they may have, they often tend to over-correct for it, giving a positive bias for the opposing choice. Once resistance is already present, however, it is a lot more difficult to change someone's mind. A somewhat successfully strategy could be to ask questions about their perceptions of the change, but to make sure it is not done in a way that could be perceived as an attack.

Performing a study researching two-factor authentication usage and people's perception of the implementation, Mahitthiburin and Boonkrong (2015) noted both areas of satisfaction and areas of resistance. Two important and related findings can be taken from their research: the more difficult it is to use a new technology, the lower satisfaction is for that implementation (which alone is not an extremely remarkable finding, but notable nonetheless), and the second is that even if the new implementation is radically different from what existed before, people are largely still willing to give it a try before dismissing it outright. This is important as the popular consensus for the new interface of Banner 9 is to be

wary as there will likely be a lot of resistance coming from employees due to how different it looks.

When it comes to finding information online, a large majority of people immediately turn to search engines such as Google for results, even when they know of official sources of information, and even when they consider the official sources to be more credible (Sangkapreecha & Sangkapreecha, 2012). When an organization produces documentation for their employees, it would then be considered a worthwhile endeavor to upload the documentation to a publicly accessible search-indexable website and use search engine optimization to ensure that employees will find the documentation first. If the information does not appear near the top of the results, employees may quickly give up. As a common phrase in today's culture is to "just Google it" whenever faced with a question one does not know the answer to, this ingrained behavior may be easier to accommodate than overwrite. A key point to keep in mind is that if the documentation posted online is too difficult to digest, employees may still look to unofficial sources online for the information, as sometimes information "written for a lay person" is easier to understand. Sangkapreecha and Sangkapreecha have found that if an information source takes less effort to read, people generally prefer it over difficult, technical information. Another popular format is that of a "wiki," mimicking the format of the popular website Wikipedia. When people have a negative experience with a new resource, they tend to attribute the experience to the resource, but when people have a negative experience with something they are familiar with, they consider it a one-off, which could explain the preference for familiarity that Google and Wikipedia provide with its pervasive use in our lives. In addition, they have found that when it comes to researching information, people tend to use similar methods as their peers

(Freimel, 2016; Sangkapreecha & Sangkapreecha, 2012). If posting online documentation publicly is not an option, the next best thing would be to focus on winning over employees who are likely to access the documentation through official channels (for example, SharePoint), and get them to be vocal about its use.

Change Agentry

Beabout and Carr-Chellman (2008) defined change agentry as "the activity of facilitating change," "a planned activity whose goal is to realign the organization with its environment." The authors compared change agentry in a variety of settings, including healthcare, government, and K-12, and find regardless of setting, that communication is a strong motivator for change agentry. The importance of the change must be stressed, and the failings of the current method must be highlighted (but not in a negative fashion: instead stressing how in the future it will be a failing, not that it is one now). As discussed in the last section, the authors pointed out that change agentry often is hindered by resistance, so that is something that one needs to always be wary about when attempting to implement change.

Clark and Nguyen (2008) defined performance improvement as "a focus on desired organizational accomplishments" including "comprehensive and systemic perspectives," in other words, organizations meeting their mission statements at all levels of an organization. Given this statement, the first step of performance improvement is to ensure that the organization has a mission statement to achieve, and goals that let it help get there. They talked about technological approaches to performance improvement and state that context-specific (as in clicking on help shows help for the current process, not a general help screen) and on-demand support are the way to go. Either employees need to have access to solve

their problems on their own through a dynamic manual or have someone available to them to support them in real time.

Hung, Jonassen, and Liu (2008) presented actual problems to a learner to get them to develop and implement problem-solving skills to resolve the problem. Problem-based learning (PBL) follows these steps: learners are presented with and attempt to understand the problem in the context of what they already know, they enter self-directed study and find resources of which to re-approach the problem, they revisit the problem, and then they summarize their learning. The authors showed through referencing various studies that PBL does not cause higher rates of retention of the material, but instead focuses on improving problem-solving skills and higher order thinking, which long-term are much more beneficial, especially as they can be applicable to many different situations and contexts. While this is an interesting method of delivering material, this might not be the best method to use for assisting with technological implementation in the beginning steps, which is what this research is studying.

Johnson and Johnson (1996), highlighted a lot of challenges that have come with implementing technology in the classroom. They covered how when computer-learning was done before 90s was with the assumption that only one person would be looking at a computer at a time, and that there is a specific style of learning that is optimal for all people (not that different styles of learning can be better for different people), and that cooperative learning (literally the opposite, having people learn via computers in groups) is a much more advantageous method of learning. Cooperative learning is suggested to follow four specific steps: deciding on the goal of the lesson and the groups/roles of learners, explaining the task to the learners and that it is intended that learners work together, regular check-in with the

groups to provide assistance and ensure they are working as a group, and then evaluating learners to ensure that they all performed their group-roles correctly and adequately. As the participants that are likely to score low on the UTAUT will likely have first been introduced to computers in the individual (vs. cooperative) style-learning, introducing them to this new style of learning technology could be beneficial in assisting them to get over any pre-existing stressors.

Lean Six Sigma

Like any large-scale implementation, when implementing new ICT, it is of utmost importance to have clearly defined goals, including clearly defined phases, timelines, and monitoring client feedback (Tipton, 2002). The amount of tuning and pre-emptive support that is done before the implementation is that much less work that needs to be done during the implementation, when resources may be needed to be used elsewhere (deployment, troubleshooting, the unexpected). By having an idea of what issues employees may face beforehand and addressing as much as possible beforehand, this reduces the pressures on employees responsible for the implementation as well, not just those who are using the new technologies. There is also an issue of time related to implementation as well. With the rapid rate of improvement of ICTs, if a specific implementation is planned for too long, it may already be outdated by the time the implementation occurs. Due to this rapid rate of improvement, it is more imperative that general themes are extracted when it comes to the challenges in implementing new technologies, rather than specific line items from a particular implementation.

When speaking about improvements in processes, it is of course important to mention Lean Six Sigma (LSS). Lean Six Sigma is a strategy used to remove wasted steps in process,

particularly when it comes to defects, over-production, waiting, non-utilized talent, transportation, inventory, motion, and extra-processing (DOWNTIME) (Summers, 2011). LSS uses the DMAIC strategy (define, measure, analyze, improve, and control) to achieve eliminating DOWNTIME, and similarly to the cybernetic feedback loops and bootstrapping, this means it analyzes the situation objectively, sees how it can be bettered, and then attempts to correct it. An important addition to DMAIC, one that this research paper is about, changes the acronym to RDMAIC, with the R standing for recognize (Webber & Wallace, 2011). The critical first step to improving a process is to Recognize the correct process being the one that requires improvement. Once the correct process is identified as needing improvements in efficiency, it is important to Define what the problems are in the process. Next, one must gather some metrics and see what the Measure we are trying to improve against should be. Afterward, one must Analyze the process and see what areas of DOWNTIME can be refined (this can be done in a variety of ways, but it is important to consider as many aspects of DOWNTIME as possible, rather than focusing on just one immediately). Critically, the next step is to Improve the process by removing a facet of identified DOWNTIME from the process. Finally, the Control step is to make sure that the change can be replicated and becomes the new standard, and it not something that immediately reverts to the old style (this can involve retraining and creating new documentation).

Taken together with the other theories outlined above, it is clear that a process improvement strategy has a high chance of success if it achieves the following objectives: defines a problem (correctly), looks to see what specific areas in the process can be improved, receives feedback (from the day-to-day users of the process), acts on the feedback, standardizes the new practice into a process that becomes the new baseline, and then looks

for more areas of improvement until it can be refined no further. This research's goal is the to define the specific areas of process that can be improved via employee feedback when it comes to implementing new technologies in a post-secondary setting.

Summary

Technostress is a vast topic and there are many related terms that need to be considered when performing a technological implementation in an institution. Birnbaum (1988) demonstrated that using reflective methods to obtain feedback (and looping the process) helps in reaching a solution to identified problems and further helps with its optimization. By obtaining feedback from employees during their use of the Banner 9 software and identifying their concerns as outlined in my thesis, supervisors might be able to identify possible solutions together with their staff members, which could then be implemented to see if that would alleviate their concerns with technology, in general, and with Banner 9, in particular. When considering this together with bootstrapping, the feedback received can be used well to improve process.

It is important to consider the feelings of the participants in technological implementations. It is imperative that they are convinced that the reward outweighs the risk in adopting the technology. To do so, as many technostress creators as possible must be mitigated, and technostress inhibitors introduced in their stead. It is also important to ensure that the correct form of feedback is being received from participants in order to better the implementation process: this feedback may need to be tuned to individuals rather than groups in some situations.

The UTAUT model designed by Venkatesh et al. (2003) will be useful in identifying the already existing attitudes present in staff members of UNBC-and will assist in

determining what kind of themes exist regarding technological implementation and highlight what kind of resistance can be expected. In addition, this information can also be useful by pre-empting what kind of training and support individual staff members might need which could inform my recommendations in the final chapter of this thesis. Further models will be examined in further reading to help refine questions for the qualitative portion of this research.

Diffusion of Innovation theory states that that advantages over existing solutions, compatibility with existing systems, complexity, testability, and observability are all essential factors to consider in technological implementations. Spreading positive news of an implementation socially is a powerful way to increase adoption, and allowing users to feel ownership over the implementation by way of personalization boosts both the social spread of the positives of the implementation and the rate of its adoption even further.

Resistance to any workplace change can be assumed to be a given, but Ford et al. (2002) and Laffey (2004) stressed that it is crucial to understand where that resistance comes from, and how to address it, as opposed to try and force against it. By understanding the individual concerns of participants, direct responses could be formulated by supervisors to alleviate any stressors and possible deterrents when it comes to adapting to new technology. Having documentation that is easily accessible in the preferred way of the user helps reduce frustration and increase standardization of training.

Finally, the Lean Six Sigma approach gives a lot of information to consider when implementing new technologies efficiently, and by addressing the “waste” that LSS aims to correct, implementations can run smoother. A smoother implementation increases users’

willingness to adopt, and the faster adoption of a technological implementation occurs, the better.

For participants that are struggling with technostress, having them work and try and solve the problem on their own is far too daunting of a task, and will likely just exacerbate the symptoms of technostress. By learning specific techniques to encourage this change agentry, by communicating in a certain way, and by being present to deliver real-time, specific support, participants will ideally succeed in the current implementation, and then also carry these learned skills forward in future technological implementations and in other aspects of life, as well. If technology is genuinely presented successfully for the purpose of improving a participant's quality of life, they will likely become an adopter when their skills are reinforced, and they are confident when they have someone to turn to for assistance. Contrary to first assumption, a lot of the motivation for change needs to come from management and is not something internal to employees themselves.

As demonstrated, there is existing research regarding implementation of new technology into workplaces, the resistances it faces, and possible strategies to lessen these resistances. Using this information, any concerns that staff members may have with the upgrade should be able to be collected, identified, and addressed.

Chapter 3: Research Methods

This chapter will begin with an overview of the research methodology, a mixed-methods approach to help identify the most data-rich participants as well as receive large amounts of data in both qualitative and quantitative formats. The study is an instrumental case study, studying the relationship between employees and the implementation, not studying the event nor the participants themselves. This assists with generalizability: the themes that were found can be used for future implementations at UNBC or other post-secondary institutions.

The chapter will then address ethical considerations for the research. As the researcher was employed at the University of Northern British Columbia when data collection was taking place, there were extra ethical considerations to consider. An information letter and consent form adopted from the University of Northern British Columbia Research Ethics Board (UNBC REB) was acknowledged by all participants. It was critical to keep in mind that participant responses could have an impact on their employment. The proposed research methodology, research questions, information letter, and consent form were approved by the UNBC REB.

Participants were recruited from UNBC's Banner users. Data collection occurred in multiple stages. The survey questions were based on dimensions of the UTAUT, and participants were then identified based on their scores. Survey responses were collected online via e-mailed SurveyMonkey links, interviews were then conducted in person, and closing surveys were completed at the end of the interviews. Interviews were analyzed via coding into four major categories: Resistance, Change, Technostress, and Personalization. The data gathered in these four themes was then synthesized into four categories regarding

the implementation. These themes provided suggestions for future implementations, that will be examined in Chapter 4. This chapter will then conclude with an evaluation of the study and summary of the chapter.

Research Methodology

Mixed methods research consists of both quantitative and qualitative aspects. The benefit of using both methods ensures that the weaknesses of one type are covered off by the other, resulting in more complete data. While there are different types of mixed methods research, this research was sequential in design, as in one method of data collection took place first, and then the other method. As well, as it is quantitative data that was collected first, and then qualitative, this research can be further described as explanatory sequential design.

Quantitative data refers to data obtained from more closed-ended questions (Cresswell, 2015). These are questions that typically have a set range of responses where scores can be derived from the responses, ranking the participant's data. A quantitative methodology approach was used to identify the level of difficulty participants were predicted to have in any aspect of the upgrade. By using their own self-reporting regarding their attitudes toward technology and the Banner 9 implementation, data rich participants were able to be identified, as those who scored lower on the UTAUT had more technostress-related outcomes when it came to the implementation.

Qualitative data refers to data obtained from more open-ended questions (Cresswell, 2015). These are questions that have responses that are not set, and instead responses are unique and varied, and can shape future questions in the interview process. This data is analyzed via coding, a strategy that researchers use that involve taking note of key words,

phrases, or ideas in participant responses and categorizing them into categories, based on participant response. Once these categories are established, the participants' responses can be sorted, and themes can start to emerge. A qualitative approach was used to identify the themes of Concerns with the Technological Implementation, Suggestions for Improvement, and Aspects Done Well. Responses were all able to be sorted into these themes, and suggestions were able to be created based on this data. Both methods of data collection and analysis will be discussed throughout this chapter.

A mixed-methods approach was best for this project, starting with the broad quantitative, and then focusing in on the more specific qualitative. By using a combination of experimental mixed methods design and the action research design, the quantitative data that is first collected provides a general explanation as to why the later qualitative data exists for the selected participants. The qualitative data then fills in the details that the qualitative data identified exists but could not specify in its broadness.

This project involved questionnaires given to UNBC staff approaching the point in time when Banner 9 was going to be required use (and Banner 8 was going to be phased out). After the questionnaires were returned, participants were interviewed to give more in-depth information. It was important to assess the effectiveness of the project as it progressed and completed, as identified in with the concept of feedback loops in the literature review: the quantitative surveys provided regular feedback based on time-elapsed, and the qualitative interviews provided specific feedback on certain trouble-areas. In this research, the quantitative questions helped identify each participant's likelihood of willingness to adopt new technology and attitude toward Banner 9. The qualitative questions helped to not only

identify themes, but also to develop what kind of support the employee would like to (or should) receive.

The first set of quantitative questions consisted of nine questions (this set being given at the start of the research project), and the second set of quantitative questions consisted of eight questions (this set was given to participants immediately after completing the interview portion of the study). As the second set of questions was only delivered post-interview, only the participants who had participated in the interview portion of the study received the second set of questions. There were twelve pre-determined qualitative questions that were asked to every participant in the interview portion of the study, but the number of qualitative questions asked differed slightly between participants, as specific follow-up questions were sometimes required.

Case Study

A case study is a type of research that focuses "on a program, event, or activity involving individuals rather than a group" (Cresswell, 2015). It is a type of ethnography, which is a descriptive study that analyzes specific behaviors or patterns of a group to examine a larger issue. While case studies can study a single individual, they can also be used to study a group of participants: by identifying the shared patterns that exist amongst participants, themes can be discovered, which is why this research style is good fit for this research. There are two major types of case studies: intrinsic, which focuses on participants in events; and instrumental, which focus on the relationship between the participants and the event.

An instrumental case study is a type of case study that does not focus on studying participants, nor an event, but rather the relationship between the participants and the event

(Cresswell, 2015). This allows for issues to be focused on and emphasized and allows the findings to be extracted for further examination. These findings can then be generalized toward other similar populations or events and used to assist in future situations. As there will be further technological implementations at UNBC with the same population, the themes discovered will provide useful suggestion with how to move forward. As well, other post-secondary institutions will have technological implementations take place (and other ones will have specifically Banner 9 implemented!), so the themes and suggestions can be useful in these cases, as well.

This research is an instrumental case study, as this research is focusing on the responses to the specific event of the implementation of Banner 9 at UNBC. It is important to stress that this research is focusing on the technostress-related behaviors that employees exhibit in relation to the implementation and the themes that can be found from their response to the implementation, not specifically on the population group of UNBC employees nor the Banner 9 implementation itself.

A strong benefit of a case study is the ability to identify patterns. The major advantage of an instrumental case study is the ability to generalize its findings. By focusing on the relationship between the employees and the implementation, this is an instrumental case study, and the findings of this research can be generalized to other situations: whether there are other technological implementations at the same institution, as well as to post-secondary institutions who have different populations who are performing a technological implementation.

Ethical Considerations

Ethical considerations for this study involved my dual role as a staff member at UNBC and that of researcher for the data collection phase of the study. This raised some concerns with that of consent: were staff members realistically able to refuse participation, or did they view it as required as part of their work? While researching, I always made clear the distinction that I was wearing my "researcher hat" when any research was being performed, but there could still have been perceived power issues present that could not only hinder the responses, but also skew responses (Cresswell, 2015). As mentioned in the last section, participants working in different departments than my own helped minimize this ethical issue further, as there is no conceivable way that I would have power over them.

The available population of Banner users at UNBC were contacted via e-mail, asking them to participate in this study with a survey link. The first page of the survey link contained the information letter and consent form, that participants were required to acknowledge before proceeding onward with the survey. These forms were adopted from the University of Northern British Columbia Research Ethics Board, and, along with all the proposed research methodology and questions, had the Research Ethics Board's approval before the research had begun. Participants who indicated they wanted to proceed with the interview stage were contacted by e-mail addresses they had provided to set up the interview and reminded of their ability to withdraw from the study at any time. Participants were also given choice of location for the interview, whether in a private meeting room, the participant's office, or the researcher's office. Before the interview began, the participant was once again explained the consent form and that they were able to withdraw from the study at any time.

It was also made clear to all participating employees that all responses would be anonymized and any possible identifying demographic (e.g., gender or age) or work-related information (e.g., department) would be masked or completely redacted. All collected data will remain private and confidential to mitigate any social risk or otherwise, and all survey responses will be destroyed a year after the survey data is collected.

Research Participants

The research participants consisted of Banner users consisting of UNBC staff (excluding Office of the Registrar and Human Resources staff): this included employees from multiple departments, as they use Banner in different capacities. These users were identified through the open-access phone directory and public institutional knowledge of which departments use Banner. As it is important to note how different users will have different needs, a variety of feedback will be valuable.

The participant population sample consisted of a convenience-sample of UNBC's Banner-using staff members willing to participate in the research. For the quantitative portion of the study, feedback was received from 13 participants. For the qualitative portion of the study, six participants were interviewed. During the fifth and sixth interviews, data saturation started to occur.

One participant indicated that they were interested in further participating in the study in their quantitative response, but then did not include contact information, so I was unable to discern who it was, and they were not included in the qualitative portion. Interview participants were compensated with a $15 gift-card to their choice of one of two local coffee chains as appreciation for their participation.

Data Collection

Two different types of data were collected: surveys before and after the interview portion (quantitative data), and interviews during the interview portion (qualitative data). The goal for the quantitative data was to identify data-rich participants and their attitudes towards Banner, and the goal for the qualitative data was to identify themes and areas of concern when it comes to technological adaptation, specifically the Banner 9 upgrade.

Surveys

Quantitative surveys were distributed, asking about personal attitudes toward technology and technology adoption, concerns about the upgrade, ease-of-use, time spent performing regular tasks, and satisfaction of the process, at the following intervals (two times in total): once the study began and a week later, immediately after the first interview. These surveys were very short, they took an average of three minutes and three seconds (excluding one survey which took the participant eight minutes and 58 seconds, and another that took the participant 57 minutes and 37 seconds: my guess is that they were distracted with something else and did not finish it all at once). The surveys were issued to staff via an e-mailed link through Survey Monkey. The responses were then stored on a password-protected computer in the researcher's home office after the data had been retrieved, ensuring each employee's responses will remain confidential.

Originally, those employees who responded with low-scoring answers in any area were to have their responses tagged for follow-up for a more in-depth qualitative interview, individually. Instead, after feedback from the Research Ethics Board, it was recommended to also interview those participants who had scored highly on the survey as well. Due to this, a range of scores from participants were interviewed, not just low-scoring participants. This

was done for two reasons: (1) It ensured that a balanced set of responses were collected since I was interested in collecting the opinions of early-adopters as well as resistors, and (2) It was likely that someone who is high-scoring on the UTAUT could also provide valuable insight with regards to themes present regarding technostress at UNBC. The survey also collected demographic information from the participants, to ensure that interview participants represented a good breadth of experience and age. At no point was it defined to the participants whether a high-, medium-, or low-score is what caused them to be identified as a candidate for the interview portion of the study, so deception was not being used.

The data retrieved from the survey was not only used to identify and rank participants based on how data rich the UTAUT predicted them to be, but also was used to get a preliminary feel on what themes might emerge from the research. Findings from the survey also provided self-perceptions regarding the participants and technology-use that will be discussed in the results chapter. As one of the questions on the survey asked if there was a specific area of concern with the Banner 9 implementation, it helped inform a follow-up question in the interview portion of the data collection that asked for participants to elaborate on the previously mentioned problem-area.

The surveys that took place after the interview largely repeated the questions in the interview but were asked in a more close-ended form to verify their responses. Participants were given another opportunity to list their one area of greatest concern with the Banner 9 implementation, to see if their response had changed from the original survey.

Interviews

To collect the quantitative data, an interview was conducted with each of the interview phase's participants once, followed by a quick-reference document of Banner

keystroke shortcut changes being provided to each participant (during the interview, most participants stated that a document like this would be extremely helpful if it existed). These interviews took place in either small rooms booked on the University campus, or the researcher's or participants' offices, based on participants' preference. A personal laptop was used to walk-through the interviews, with the interview questions prepared ahead of time. In case of follow-up, slight deviation from the questions occurred with the addition of questions meant to probe for more information. None of the previously prepared questions were omitted from any of the interviews, even if the participant had already answered the question in a previous response (the questions was simply asked again, with acknowledgement that the participant may have already answered it).

With the participants' permission, the interviews were audio-recorded, as a full-transcription assists with extracting data such as themes more so than note-taking could. All transcription was done fully by the researcher alone. The audio recordings were deleted after they had been transcribed, and the transcripts will be deleted once the study is fully complete using double-deletion. Participants were informed of the above both on the Information Letter/Consent Form that they had acknowledged during the survey, again in the e-mail asking for an interview, and in person directly before the interview, as well as their ability to withdraw from the study at any point in time.

The questions in the interview covered various aspects of Banner 9's implementation, focusing on time spent on activities in Banner 9, satisfaction with Banner 9, and suggestions and concerns. The time spent section was aimed at gauging if employees were as effective in their daily tasks in Banner 9 as they were in Banner 8 and identify any areas in which participants struggled in. The satisfaction section was used to gauge participant perception of

Banner 9 as well as identifying any areas that could help their positive perception of Banner 9 or make their daily tasks easier. The suggestions and concerns section was used to let participants voice any inconveniences, challenges, and suggestions they had for the implementation, as well as list areas they thought were done well, any specific future training they would like, and any other questions or comments that they would like to voice.

Each interview in the study was immediately followed by the second quantitative survey. This reflective methodology is very similar to that of action research, and the steps of Stringer's (2013) Action Research Interacting Spiral: Look, Think, Act, [repeat]: a necessary model when dealing with procedures that are complex, non-linear, and require revision, such as implementing a project or optimizing learning. Collecting the data in this method assisted with the data serving multiple purposes: to identify any pre-existing attitudes that exist toward technology adoption with the initial survey, to have a measure of the adaptation rate amongst surveyed staff, to find out how to increase the adaptation rate via the qualitative interviews and subsequent assistance, and to find out what specific themes regarding technological adaptation existed with those who had difficulty with the adaptation. As data saturation was starting to occur, repeated cycles were deemed as not necessary, and the data collected was sufficient to identify themes and make suggestions based on the discovered themes. With data on these areas, the research question was answered, and the data obtained can be used to assist with lessening the quantity of work required for future technological implementation at UNBC.

Data Analysis

The research began with the first set of quantitative survey questions. The responses from these questions corresponded to dimensions on the UTAUT and other technological

adaptation models. This data was used to identify and gauge adoption rates, attitudes towards technology, and attitudes towards Banner 9 amongst staff. For example, a question asking about a participant's voluntariness of using newer technology corresponded to one of the dimensions on the UTAUT. If a participant scored low on this question, it lowered their total score. If a participant's scores totaled to a low amount, it is likely that they face difficulty when adopting new technology and will therefore be a data-rich participant. Once scores and demographics were calculated, participants were organized based on how much data the UTAUT predicted they would provide. For validity reasons and at the request of the Research Ethics Board, participants from across the range of scores were selected for the interview.

Afterward, the qualitative data (the open-ended interview questions' responses), were coded to indicate whether each piece of feedback regarding the upgrade was positive, negative, or neutral in response. The participants' experiences, performance, and satisfaction indicated their attitudes towards the Banner upgrade and through this data, commonalities or differences were able to be identified, and themes extracted. An area that was identified as a significant struggling area for even one employee was noted: while it is possible that this problem may be unique to the one participant, it is more beneficial to assume that this problem may exist for other users as well. These qualitative responses were examined for key words and coded for identifying themes regarding technology adoption and problem areas that were either unique or common amongst staff. This coding process will be explained in detail in the next section.

After the interviews, a second set of quantitative survey questions were asked to ensure that the data captured from the interview was interpreted correctly, as well as to

emphasize any critical point that participants felt was important to be stressed. This information together with the coded data from the qualitative interviews were used to inform the most common themes in the implementation as well as provide suggestions for future implementations.

Coding

The coding used in this study corresponded to the main focuses of the research question and aspects related to technostress. Referring to the goals of this research helped identify what kind of codes would be useful information and pertinent to identifying themes that inform suggestions for future implementations. By going through the data repeatedly, strong coding informed strong categories from which to find themes, and focused direction of these themes led to strong suggestions for future implementations.

Coding involves creating a word or phrase label that is linked to and accurately communicates the ideas behind participant responses. It was important to highlight what the participants were sharing with their data, so the goal was to pick codes that voiced their responses well. The types of coding that were used in the first round of coding included inconveniences or benefits of Banner 9, affective words related to attitude toward the implementation, non-affective words related to attitude toward the implementation, differences or similarities between Banner 8 and 9, areas of resistance or hindrances to adoption, concerns about process, and suggestions for improvement. Data was coded using the coding strategy of lean coding, in which a smaller, manageable number of codes are assigned to participant responses based on the overall message behind participant responses to questions (Cresswell, 2015).

After the data was coded as such, the literature review was re-referred to and I created an additional list of potential codes to consider when going through the transcripts for coding a second-time. This list included a list of technostress-related concepts, key areas regarding adopting new technological implementation, and functionality that differs between Banner 8 and 9. To ensure that important data was not missed, in this round, participant responses were divided into "text segments," pieces of the responses that held meaning or meanings (Cresswell, 2015), and each of these text segments was assigned one or more codes. In addition to another quick run-through of lean coding, data was also coded using the coding strategy of in vivo coding in this step, which involved creating codes using direct quotes from the participants' responses (Cresswell, 2015).

Data was re-coded with the additional codes, and the coding recorded from the two rounds of coding were added together to make a list. The frequency of repeating codes was noted (within participant responses and in total of all participants), and the list of codes was cleaned up to a more usable state. These codes were then organized into sections based on their type, which gave us the four sections of Resistance, Change, Technostress, and Personalization. There were some codes that did not fall neatly into any section. In addition, these codes did not result from a significant number of quotes or utterances and were considered outliers. For this reason, this small number of codes were discarded. According to the guidelines in Cresswell (2015), this process of organization helps eliminate redundancy and assists with focusing on information pertinent to the goal of the study. With this list, I went back to the transcripts and used this organizational scheme to see if new codes would emerge and if the participant responses supported the coding and coding sections.

Finally, with all of the codes gathered and organized, the codes needed to be synthesized to provide information that is digestible to the reader. Four categories were created from this process: suggestions for improvement, frustrations and concerns, implementation done well, and other areas of interest.

In coding, a theme is a group of codes that together lead to form a major idea (Cresswell, 2015). By organizing my coding into the six categories, it was easy to discover the themes in this research that would lead to strong suggestions for future implementations. They were the ideas that repeatedly occurred in the data from participant responses, as well as important ideas that, supported by information in the literature review, were noteworthy enough to be important to include.

Evaluation of the Study

Steps were taken to minimize threats to internal validity. Regression refers to the phenomenon that occurs what researchers select participants based on extreme scores on the ends of a spectrum: scores tend to "regress" or move toward the mean with repeating testing (Cresswell, 2015). By selecting participants from across the range of scores, including those closer to the average, radical fluctuation in scores in minimized. As low-, medium-, and high-scoring participants completed the second survey, there was a minimized risk of regression. Participants were selected using convenience sampling, so it is possible that the type of employee that would not participate in this research is the same type of employee that does not speak up when they have concerns or problems with technological adoption, and therefore unique data that they might have was not included. This is tied to a partial goal of this study: if it is shown that employees have their voices heard, more employees may be willing to speak up. Interview participants were thanked with a $15 gift-card to their choice

of one of two coffee shops located in town, however, this compensation was not revealed to participants until after they had already indicated they were willing to participate in the interview process, so this did not sway participants' willingness to partake in the interviews. Participants were not told what their scores were on the survey portion of the study, and as participants from different scores were interviewed, there was no chance for resentful demoralization, as they could not know what their scores were.

While conducting the interviews, the researcher ensured that all the pre-determined questions were asked of every participant, even though they may have already answered the question (and this was told to the participant to ensure that they did not feel like they were just repeating themselves). This aspect of reflexivity ensured that the researcher was not missing any information due to any preconceived notions about the participant, as the researcher did know what the participants' scores on the survey. As well, as the original research project only aimed to interview low-scoring individuals, it was interesting to note that a lot of good feedback, in reality, came from the high-scoring individuals. By the researcher putting aside their bias, they were able to get more constructive data.

Regarding credibility, as the researcher is also a Banner user and has also worked directly with some of the participants in a professional setting previous to this study, the researcher did their best to put aside their own opinions regarding the Banner upgrade for the duration of the interview, and approach the interview fully as a researcher, and not as an employee: they also made it very clear in every step of the study (when sending out the surveys, when requesting to meet for the interview, and before starting the interview) that this study was performed academically as a researcher, and not professionally as an employee. This had the added authenticity bonus of having employees more willing to share

their dissatisfactions with the upgrade, as they know that the researcher did not have a personal stake in its implementation and was performing the study for their own purposes. The researcher also made sure to be sensitive to participants potential lack of ability when it came to adoption of the new technology.

This study focused on the implementation of Banner 9 at UNBC. How the study was performed is easily transferable to different institutions, and for different technological implementations. None of the questions are specific to Banner nor UNBC but are constructed in a way as to receive specific information regarding whatever technological implementation is being studied. During data collection, the later interviews started to repeat information without offering any new or unique responses, resulting in data saturation. As data saturation had occurred in the study, this fact indicated that the study was dependable.

Summary

This research is an instrumental case study, focusing on the relationship between an event and the individuals involved in the event, not studying the event or the individuals themselves. The strength of using this research method enables the identification of patterns, which is ideal as identifying themes and suggestions for future implementations is the goal of this research. Using the mixed-methods approach of qualitative and quantitative methodologies to collect data was key to ensure that participants from all areas of the UTAUT were represented, and specific, detailed data was collected.

While the scope of the study had changed significantly from the beginning, the suggestions made turned out to be improvements when it came to evaluate the study's credibility and mitigating any biases or ethical concerns. The research proposal, information letter, consent form, and proposed questions were all approved by the University of Northern

British Columbia Research Ethics Board. Participants were contacted via e-mail, and acknowledged an information letter and consent form as the first part of the survey. All data was anonymized, data will remain confidential and secure, and it was repeatedly made clear to participants that this research was being conducted as a researcher (not as a UNBC employee) and that they could withdraw from the research at any point.

Research participants were taken from a convenience sample of Banner users at UNBC. Data was no longer collected after data saturation started to occur. By ranking participants using the UTAUT, participants covering a good breadth of UTAUT dimensions was able to be identified and selected for the interview portion of the research. Having a breadth of participants also helped control for threats to validity such as regression. By ensuring that the qualitative questions were asked of all participants in the same way and ensuring that they were asked even if they had already been answered strengthened the study with reflexivity. I made sure to emphasize my approach toward the research as a researcher, and not as a UNBC employee, and acknowledging these dual roles helped establish credibility. The questions being written in a way that they could be ported to other technological implementations and other institutions also assist in the validity of the themes being extractable for future implementations. The occurrence of data saturation shows dependability.

The quantitative data from the survey did a great job in identifying participants' likelihood to adopt new technologies. The qualitative data from interviews was able to extract key themes and suggestions for improvement from participants across the spectrum. Using both in vivo coding and lean coding, participants' responses were able to be evaluated more uniformly and themes and suggestions were able to be easily identified across their

responses. These themes and suggestions for improvement will be discussed in the following Results chapter.

Chapter 4: Results and Discussion

This chapter will report the results of the study and will begin by detailing demographics and other information about the participants in this study. Staff from the Office of the Registrar were excluded from participating in this research, and the University of Northern British Columbia is not a large institution which resulted in the population of Banner users eligible to participate in this study being reduced. The participants in this study still provided good representation of the university's demographics.

After a section on participant selection and demographics, this chapter will report the results from the opening survey section of the study, followed by the interview section of the study, and finally the closing survey section of the study. The purposes of the survey were to receive participant demographics, see how users self-reported their willingness to use technology, and receive their opinions regarding Banner 9. The interview was designed to receive more data from the participants regarding three specific areas of Banner 9: time spent compared to Banner 8, their satisfaction levels with Banner 9, and an area for any suggestions and concerns that were not covered, as well as a chance to reiterate any concerns that they would like stressed and emphasized. Immediately after the interview was concluded, participants completed a second survey which re-visited some of the questions in the first survey to measure if there was any change in participants' reports of time spent in Banner 9 compared to Banner 8, their need for further training, and anything else related to Banner 9 overall.

Themes, findings, and discussion of the results will close out the chapter. The themes showed that participants were generally more receptive to the technological implementation than expected. Strong emphasis from multiple participants was placed on key areas: these

themes will be included in recommendations for future technological implementations in the next chapter, as these are changes that can have significant impact when it comes to worker satisfaction regarding implementations.

Participants

The participant population included all Banner users at UNBC who were not part of the Human Resources department, nor the Office of the Registrar. Of the eligible participants, 13 completed the quantitative surveys. The age of participants ranged from "20 or under" to "51-60," with 11 participants identifying as female and two identifying as male. Of these 13, six were further selected for the qualitative interviews. All interview participants were employed in different departments at UNBC, so a wide breadth of information was captured without any position-specific repeats. Interview participants also represented a strong diversity regarding years employed at UNBC (or with Banner), with representation of working with Banner for over 20 years, as well as representation of working with Banner for under a year.

Initial Survey Response

The first section of the initial survey that was sent out to participants was designed to gauge their technological familiarity scores on the UTAUT, which would correspond to their willingness and ability to adapt to new technological implementations. Table 1 contains the responses from the surveys.

Table 1

Initial Survey Responses on the Likert Scale Section (Strongly Disagree to Strongly Agree; n = 13)

Question	Response				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I feel anxious about using computers.	6	7	0	0	0
I enjoy using new technology.	0	0	4	6	3
I am confident in my computer skills.	0	0	1	8	4
I am comfortable using technology.	0	0	1	8	4
I'm usually the last in my circle to own the latest technology.	1	1	4	5	1

Table 2

Initial Survey Responses on the Closed-Ended Section (Yes, No; n = 13)

Question	Response	Frequency
Can you think of a time where you were previously unsatisfied with an upgrade in the workplace?	No	6
	Yes	7
Have you done any pre-training regarding Banner 9?	No	5
	Yes	8
Have you already used Banner 9?	No	5
	Yes	8

Table 3

Initial Survey Responses on the Demographics Section (n = 13)

Question	Response	Frequency
What is your age?	20 or Under	1
	21-30	3
	31-40	4
	41-50	1
	51-60	4
What is your gender?	Female	11
	Male	2

There were significant responses identified by corresponding low scores on the UTAUT in the Likert scale section (see Table 1). The survey question about enjoying using new technology had four "Neutral" responses (30.77%). The confidence in computer skills survey question had one "Neutral" response (7.69%). The comfortable using technology survey question had one "Neutral" response (7.69%). Finally, the being last in their circle to own the latest technology survey question had four "Neutral" responses (30.77%), five "Agree" responses (38.46%), and one "Strongly Agree" response (7.69%).

From Table 1, significant responses can also be identified corresponding to high scores on the UTAUT. Nearly half of all participants (six participants, 46.15%) stated that they "Strongly Disagree" with the statement about feeling anxious about computers. Three participants (23.08%) stated that they "Strongly Agree" with the statement "I enjoy using new technology." Four participants (30.77%) stated they "Strongly Agree" with the statement "I am confident in my computer skills." Four participants stated that they "Strongly Agree" with the statement that "I am comfortable using technology." Finally, one participant (7.69%) chose "Strongly Disagree" for the statement "I am the last in my circle to own the latest technology."

There were also significant responses identified by corresponding low scores on the UTAUT in the closed-ended section (see Table 2). When asked if participants had been previously unsatisfied with an upgrade in the workplace, there were seven "Yes" responses (53.85%). Over a third of participants (38.46%) did not do any Banner 9 pre-training or had even used Banner 9. The implications of both the low-scoring and high-scoring results will be discussed later in the chapter.

Patterns in the data were also present. All respondents indicated that they disagreed with the statement of feeling any anxiousness about computers. All respondents indicated feeling neutral toward or enjoying new technology, with about twice as many respondents having indicated enjoyment versus those who were indifferent. All respondents indicated they were confident with their computer skills, with approximately a third indicating that they felt strongly confident. All respondents indicated that they were comfortable with using technology, with approximately a third indicating that they were strongly comfortable. Over three-quarters of respondents indicated that they agreed with being the last in their circle to own the latest technology.

The participant demographics ranged in age from "20 or Under" to "51-60," with the mode age scores being tied between "31-40" and "51-60" and comprising of 61.54% of the total scores). Eleven participants identified as Female (84.62%), and two participants identified as Male (15.38%). The demographics were included in the event of a larger sample size or potential significant outcome that might have resulted, but due to the small sample size and non-significant outcome, the demographics will not be discussed further in the thesis.

Table 1, Table 2, and Table 3 provided the responses of the participants in the close-ended answer section of the initial survey, and patterns were identified through those responses. In addition to the close-ended responses, participants were also asked an open-ended question in the survey that asked them to list one problem they have struggled with in Banner 9, if one existed.

Via the open-ended section of the survey, participants submitted areas of concern including the keystroke shortcuts changing between versions of Banner, missing

functionality from the old version, the inability to read screens as well, the speed of the new version of Banner, and not enough time to test out the new version. The missing functionality reported by users was specifically regarding printing reports: this functionality being missing resulted from Banner 9 moving away from being Oracle-based, and the IT department was working on a fix (this was reported by three participants). The inability to read screens referred to personalization, specifically regarding font size and interface colours, as some users reported difficulty reading the defaults. By changing the colours or font size in Banner 8, they were able to read screens easier, but that personalization was removed from Banner 9. The speed of the new version of Banner referred to both the increased load-time for forms as well as delay causing keyboard commands to input data into the wrong fields (e.g., “I can type and tab faster than it can keep up"). In Banner 9, when commands are quickly entered in succession, Banner no longer processes the commands in order and instead receives the commands all at once. This causes errors as previously experienced users will enter commands quickly, and the pre-entered commands become entered in an unintended order. Some participants listed struggles with the interface’s drastically different look compared to Banner 8, with one participant stating that Banner 9 had a “major change in user interface, difficult to adjust,” and another listed a concern with navigation, stating frustration with “the fact that when you are in one of the Banner screens you have to click out to use another one. It would be great if you could [link] to other forms within a form.” Finally, a participant reported “I'm too far behind at the moment to learn or test a new system… just a bad time to implement.”

Table 4
Themes, Pertinent Codes, Frequencies, and Sample Quotes (n = 313)

Themes	Frequency	Sample Quote
Resistance	171	"I'm sorry, this is just frustrating, this doesn't look anything like what I'm used to working with at all"
Change	75	"I would like more training on reading certain screens"
Technostress	52	"I just shut it down, and I didn't have time to deal with it"
Personalization	15	"It would be nicer if I could adjust the screen to make it a little bit bigger"

In addition to the survey questions from which the closed- and open-ended responses were received above, participants were also asked if they would be willing to further participate in a more in-depth interview regarding their responses and experience with Banner 9. Some of the respondents who agreed were followed up with to expand their views in semi-structured interviews which will be laid out in the next section.

Interviews

As outlined in Chapter 3, the interviews were transcribed and analyzed for themes with the eventual goal of dominant themes. In total, there were 325 utterances that led to 54 significant codes. (see Table 4): 12 of these utterances were considered non-significant outliers, and were discarded.

Coding. From the interview data, a large number of codes were assigned. To help synthesize the data, the codes were collected into groups of similar information: the codes were largely categorizable into the themes of Resistance, Change, Technostress, and Personalization. The resistance theme contained codes that referred to times where participants expressed difficulty or frustration with the implementation of Banner 9, such as lack of transparency, frustration, difficult, documentation, and reference to Banner 8. The

change theme contained codes that referred to the implementing of Banner 9, such as training, optimistic, change, adjustment, and training. The technostress theme contained codes that referred to the positive and negative attitudes and emotions that came with adopting Banner 9, such as anxiety, skepticism, low self-efficacy, overload, and satisfaction. The personalization theme contained codes that referred to the desired ability to personalize Banner and the benefits/detriments that personalization/lack of personalization result in, such as lack of personalization, missing personalization, and no personalization.

The Resistance theme's codes appeared a total of 171 times, consisting of 19 unique codes. Some of these codes included Frustration, which appeared 28 times; Lack of Transparency, which occurred 16 times; and References to Banner, which occurred 17 times. The Frustration code referred to responses where participants expressed irritation toward Banner 9: "I'm sorry, this is just frustrating, this doesn't look anything like what I'm used to working with at all." The Lack of Transparency code referred to responses where participants indicated that the communication regarding the Banner 9 upgrade did not make things clear for them: "I haven't really learned any of the new things about Banner 9, like about any of the improvements." Finally, the References to Banner 8 code referred to responses where participants compared Banner 9 to Banner 8: "I wish they would have left the keys and shortcuts the same as Banner 8."

The Change theme's codes appeared a total of 75 times, consisting of 18 unique codes. Some of these codes included Training, which appeared 15 times; Optimistic, which appeared 11 times, and Support, which occurred six times. The Training code referred to responses where participants indicated areas of training that they would prefer: "I would like more training on reading certain screens." The Optimistic code referred to responses where

participants indicated they were hopeful that Banner 9 will bring positive change to their work: “I wasn’t satisfied with Banner 8, so I’m optimistic with Banner 9 that there will be changes that are required or necessary, and they will be helpful.” The Support code referred to responses where participants mentioned the level of support they were receiving: “I think IT has been really good about coming around and being accessible.”

The Technostress theme’s codes appeared a total of 52 times, consisting of 13 unique codes. Some of these codes included Uncertainty, which appeared nine times; Low Self-Efficacy, which appeared four times; and Overload, which appeared four times. The Uncertainty code referred to responses where participants stated they were unsure if Banner 9 was doing what it was supposed to do during tasks: “You sort of second-guess yourself with what you’re doing.” The Low Self-Efficacy code referred to responses where participants expressed low confidence in their ability to use Banner 9: “If I don’t get what I’m expecting, I wonder ‘did it work, or did I do something wrong?’” The Overload code referred to responses where participants indicated that there felt learning Banner 9 was overwhelming: “I have spent more time trying to figure out what I was doing that I actually spent with Banner.”

The Personalization theme’s codes appeared a total of 15 times, even though it only had one unique code, Personalization: “It would be nicer if I could adjust the screen to make it a little bit bigger.” While there was only one code referring to personalization, it was significant enough of a topic to be identified as a section due to how often it was referred to, how emphasized it was, and its prominence in the literature. In addition, the theme was unique enough to not fall into any of the other themes identified.

Participants emphasized some suggestions for improvement, including the offering of more workshops, restoration of personalization functions, more easily accessible documentation and increased transparency were important to them in their interview responses. Participants also listed frustrations and concerns in their responses, including missing functionality, technical issues, and lack of personalization. Participants offered insight on what aspects of the implementation were performed well, and aspects of Banner 9 that were positive. Finally, participants also expressed a variety of miscellaneous specific concerns, that are also noteworthy. With the above, participant responses were synthesized into four digestible areas: suggestions for improvement, frustrations and concerns about the implementation, aspects of the implementation that were done well, and other areas of interest.

Suggestions for improvement. Five participants requested specifically requested that they would like workshops/training to assist with the Banner 9 implementation. Four participants requested the restoration of the personalization function in Banner 9. Four participants requested more accessible documentation to be provided. Finally, three participants suggested that improved transparency from IT services would also assist with the implementation.

It was interesting to note that participants wanted Banner 9 workshops for a variety of reasons, which included general training and information, role-specific training, learning how other positions use Banner, and a “tips and tricks” session. Some participants who requested more training workshops reported that they were aware of training workshops that took place previously but were unable to attend them due to work constraints, while others only found out about them after they had already taken place. A participant stated, “I think some

workshops or discussion groups would be really helpful so people can point out things they know, especially for people who don't have a team."

As noted above, the lack of personalization causes some difficulty in reading text on some forms, so users strongly emphasized restoring that functionality to assist with their work. There were issues reported with text being the same colour as the background in areas, the text being too small in some areas to read, and tables having their text too close together without separations to differentiate fields.

Participants also mentioned regularly throughout the interviews that they would like more (or more relevant) documentation. While participants were able to find some form of documentation to assist them, they did emphasize that learning Banner 9 would be more helpful with documentation pertinent to their roles. Participants reported being unable to find documentation that suited their needs, if it even existed. Having documentation more accessible to users or having IT assist users in creating role-specific documentation was requested. One participant stated, "I didn't find the SharePoint document user-friendly at all… it took me a while to find [it]… but I have to break this down into another table for myself, because there's too much in there." Finally, some participants viewed some responses they have received with some skepticism, as they were unsure if functionality was actually unavailable in Banner 9, or just unavailable to the individual users based on some management/role decision.

Regarding transparency, it was reported that users do not have a clear scope on how Banner is set up institutionally, as one participant stated "Who is that going to impact when I make changes? What forms when I go into to look at something do I not have access to and why?" and another that "Some departments are really siloed with who handles what and what

gets updated or looked at, so I change one thing and it impacts them, and I don't know what." This lack of transparency caused users to be skeptical of whether certain aspects of Banner functionality are missing or non-existent, or if they simply do not have access to potential functionality. It was also reported by a participant that it would be helpful for the sake of transparency and trust-building if the IT department distributed some sort of communication to users that indicated information such as what they were currently attempting to address, what's coming next, and what changes have been made. Participants stated that there is currently the assumption held by many users that whenever there is an update, it is fixing something broken, not installing a stability update or adding features, and dispelling that harmful conception could prove beneficial for the IT department. Participants also voiced some confusion as to why UNBC was moving to Banner 9 at all, as they reported that any benefits or necessities were not communicated to staff at all.

Frustrations and concerns. In their interviews, participants also listed frustrations and concerns when comparing Banner 9 to Banner 8. All six participants discussed missing functionality, technical issues, keyboard commands being replaced by mouse input, and a change in speed. Two-thirds of participants discussed loss of personalization features. Half of the participants reported feeling uncertainty while using Banner 9. One participant reported feeling overloaded with having to learn Banner 9 and perform their regular tasks.

The missing functionality most-often requested by participants was that reporting (being able to print reports directly from Banner) was missing in Banner 9. There were work-arounds in place for some instances, but participants stated that they were concerned with the accuracy of those reports, and some participants did not have work-arounds in place and were unable to print reports in Banner 9 entirely. One participant stated, "One of our major

struggles is Banner 9 catching up, or updating… we'll go into Banner 8, print off the exact same report, and the [data is different]." During data collection, IT was working on a solution to this problem by rebuilding reporting functionality into Banner 9.

Participants also reported some one-off, technical, role-specific missing functions, but it is unclear whether the functionality was missing or just moved. Every user mentioned some aspect of technical issue with Banner 9, whether it was the browser crashing, login issues, or getting strange errors that they were unable to replicate when performing regular tasks.

All participants mentioned the change in navigation from primarily keyboard in Banner 8 to primarily mouse in Banner 9. While all participants mentioned that they prefer the keyboard (e.g. "Getting used to the user interface of Banner 9 is a little bit of a challenge"), multiple participants did say that using the mouse is more intuitive, especially for new users, as computer users normally use the mouse to navigate in many other programs, such as Internet browsers. One participant stated, "It seems more intuitive because we generally use websites and stuff with the mouse… and it looks more like a user experience than some other web-based browser or whatever, so from that perspective, it seems like it's an easy adjustment."

All participants commented on the reduced the speed of Banner 9. Forms take longer to load, which results in wasted time and frustration for users. Similar to the survey response, it was again mentioned by participants that the delay in Banner 9's switching areas of a form causes keyboard commands to input data into the wrong fields, causing errors as the pre-entered commands become entered in an unintended order.

Participants regularly reported that personalization options were not available to them in Banner 9: participants reported struggling to read text on some forms due to the default colour palette being difficult to read, as well as the inability to change font size as a hindrance. Some participants reported being uncertain if their changes were saved, or if an action was performed.

Implementation done well. Areas of the implementation that participants were happy with include the advance notification that the upgrade was going to occur provided by the IT department, and the IT departments availability for support. It was reported that the timing of the Banner 9 upgrade was not optimal, but then also mentioned that there was no real optimal time to do the upgrade, and that the IT department did give them plenty of notice of the upcoming change, which was a welcome effort compared to previous campus-wide implementations. It was also reported that the IT department was successful in getting some users motivated for the change, as they were optimistic toward the prospect of getting possible tailored functionality and personalized training for Banner 9.

While some participants did report that they could use more support, (whether it be further training or more accessible documentation) more than one participant reported that IT support has been readily available and accessible, and that they could not think of a way for it to improve (e.g., “I think IT has been really good about coming around and being accessible”). One participant reported that they were happy with the upgrade because, “It’s actually great to learn something new.”

Aspects of Banner 9 that participants reported positive experiences toward included increased user-friendliness (reported by three participants), increased accessibility, (reported by three participants), and unexpectedly, its similarity to Banner 8 (reported by three

participants). It was reported that "user-experience wise [Banner 9] is a little cleaner. A lot easier to start your search." They also stated that while learning where what they were looking for was located or how to access it was more tedious and difficult initially, after learning how to navigate to the form, they found it quicker and simpler to get there in Banner 9 than in Banner 8 (e.g., "For Banner 9, I find that it's a little bit more user-friendly"). Another benefit reported was that Banner 9 was more accessible than Banner 8 as there were no pop-ups or installs required to use it after maintenance: "It's nice that you can go online and log in through your browser without needing a Java update or anything like that." Participants also reported that it was extremely useful that Banner 9 was mostly the same as Banner 8: it was only the appearance and navigation that changed significantly, and the procedures for most processes was the same. It is important to note as well, that while participants had a lot to say about the Banner 9 implementation, a large majority of the participants interviewed reported that they were generally happy with the upgrade and implementation and were optimistic about it moving forward.

Other areas of interest. There were statements from the participants regarding UNBC's Banner 9 implementation that they felt would be helpful to point out. One participant reported that making things clearer on the access pages for users would be beneficial: on the splash screen to log into Banner, the Banner 9 environment was listed as "Banner 9 Admin Pages" and the participant was unsure if this meant that this Banner 9 environment was just for administrator access or to access standard Banner 9 for users. As the text on the splash page is sparse, the participant suggested, if possible, that it be renamed to something else or have additional text explaining what the different environments correspond to.

According to the participants, some areas that the Banner 9 implementation could have been be improved on included having the old Banner 8 environment available at the same time as Banner 9's official launch and highlighting the similarities between Banner 8 and Banner 9. It was reported by participants that while Banner 9 was available to users to get familiar with for a decent amount of time, it was not in a very useable state (due to slowness and errors), so some users did not take advantage of that time to learn Banner 9. Some participants reported feeling demoralized immediately, believing that Banner 9 was always going to be as slow and error-prone as it was when it launched, so they continued to primarily use Banner 8. A participant stated, "I tried a few keystrokes, realized that they weren't working, and… I went straight back to Banner 8." Once Banner 9 was in its useable state, Banner 8 access was removed: every participant stated that they learned navigation in Banner 9 by having Banner 8 open alongside it and deducing where things would be in Banner 9 by following the logic. As Banner 8 access was removed, this was no longer possible for users who were not quite trained up on Banner 9 when it became mandatory to use. Many users reported that Banner 9 and Banner 8 mostly differed superficially, and that they were very similar to use once they got used to the navigational changes. As a lot of staff were concerned by "the big changes" that were coming, by instead reinforcing the belief that it is not all too different in use could have helped those users who were slow to adopt Banner 9 as their primary Banner environment.

In Banner 8, the system notifies users via an unobtrusive line of text at the bottom of the window. In Banner 9, nothing is written at the bottom of the screen, but instead there is a small pop-up that appears in the top-right of the screen. This is also linked to a user interface issue that multiple participants listed: when the system provides you with this notification, it

covers up part of the screen that is required to proceed (for example, when a change is saved, the notification informing you that the changes have been saved covers the button to proceed to the next part of the process). A participant stated, "I always think, 'Get out of the way, stupid pop-up,' and then I'm like, 'Oh, it's actually telling me something.'" Participants reported that they sometimes would get confused by the browser's toolbar, mistaking it for Banner 9's toolbar, and for example, would hit the back arrow, which would take them out of Banner entirely. Related to this, participants also mentioned that switching windows is problematic, as they may accidentally leave the Banner tab open and it could lead to privacy concerns if they were showing a student something online and Banner information was left open as the last selected tab. Finally, one participant reported that they were being overloaded, as their workload was extremely difficult to manage already, and having to relearn Banner on top of it to do so was not manageable.

The data from the interviews refer specifically to the Banner 9 implementation at UNBC, but these findings can easily be extrapolated for any future implementation done at UNBC, as well as implementations performed at other post-secondary (or even non-post-secondary) institutions. Many of these changes to implementations can be done without large expense, but in the instances where resources are not able to be allocated to address the concerns, it is still beneficial for implementors to be aware of possible challenges that they (and their users) may face and can take pre-emptive steps to prepare and/or inform their user-base of these challenges to reduce resistance (Ford et al., 2008).

Closing Survey Response

The closing survey took place immediately after each interview was concluded. The closing survey asked participants to reiterate their feelings toward Banner 9, as described in

the interview, in a more concise and quantitative fashion. The closing survey consisted of both Likert-scale questions as well as one open-ended question.

By analyzing the responses, significant responses can be identified revealing attitudes toward Banner 9. When asked "How do you feel about the Banner 9 upgrade?", one participant responded "Excited," and three responded "Optimistic:" these positive responses total twice as many as the "Concerned" and "Slightly Concerned" responses together. When asked "Has there been any change in how long it takes to perform your daily tasks?" one participant responded "Faster," while every other participant indicated that their daily tasks were slower (three; 50% of participants), or much slower (the remaining two). When asked "How do you find Banner 9's usability compared to Banner 8 (the previous version)?" half of the participants (three) reported "About the same," one participant reported "Easier," one participant reported "Difficult," and the remaining one participant reported "Very Difficult". When asked "How satisfied are you with Banner 9?" every participant responded that they will be just as familiar with Banner 9 as they were with Banner 8 with extra time, or with extra training.

Patterns in the data were also present. Twice as many participants indicated that they felt optimistic about the Banner 9 upgrade than participants who indicated concern. All but one participant indicated that Banner 9 takes longer than Banner 8 to perform their daily tasks. Twice as many participants indicated that Banner 9's usability was about the same or easier than participants that indicated Banner 8's usability was easier. A third of participants indicated dissatisfaction with Banner 9, a third indicated neutrality toward Banner 9, and a third indicated satisfaction with Banner 9. Two-thirds of participants indicted neutrality with feeling supported with the Banner 9 training they were receiving.

The responses of the participants in the Likert-scale section of the closing survey provided data from which patterns were identified, just like the initial survey. In addition to the Likert-scale responses, participants were also asked an open-ended question in the survey that asked them to list their number one concern with Banner 9, if one existed.

Responses from the open-ended question revealed that half of the participants did not think there was anything significant enough to report. The other half of the participants provided unique responses which consisted of the keyboard shortcuts changing, reports being unavailable in Banner 9, and the slow speed of Banner 9. The initial survey, the interviews, and the closing survey comprised the three sections of data gathering, and the results have now been reported. The next section will summarize these results before the discussion will take place.

Results Summary

Based on the data from the initial survey, the six interviews, and the closing survey, this section will summarize the significant results. The initial survey gave us an understanding of the level of technological familiarity of the participants, in relation to the UTAUT. The interviews gave us in-depth responses on participants' suggestions, frustrations, and opinions of the Banner 9 upgrade. Finally, the closing survey gave us insight into how participants were feeling about the Banner 9 upgrade going forward.

The initial survey reflected that a majority of participants provided responses that scored highly on the UTAUT, although a few participants did provide lower-scoring responses. When asked specifically about technological implementation in the workplace and Banner 9, however, a significantly larger number of participants indicated that they had been unsatisfied with previous implementations and had taken no steps toward familiarizing

themselves with Banner 9. The open-ended section of the survey provided us with a variety of concerns, including missing functionality, inability to read screens, slow speed of Banner 9, and not enough time to familiarize themselves with Banner 9.

The interview questions asked participants about three key areas: differences in time spent between Banner 8 and 9, their satisfaction with Banner 9, and any suggestions, concerns, or additional comments. The three key areas they reported on had their own conclusions: participants reported that activities took longer in Banner 9 than in Banner 8, that participants were generally satisfied with Banner 9, and participants had a collection of suggestions and concerns regarding the project. From these responses, a wealth of additional data was categorized into four sections: suggestions for improvement, frustrations and concerns about the implementation, aspects of the implementation that were done well, and other areas of interest.

Participants had many suggestions regarding what could make Banner 9 easier to use. Personalization was mentioned repeatedly for accessibility purposes (font size and colour). Ease of access of documentation and increased frequency of training workshops or discussions were also mentioned by a majority of participants as something that would be exceptionally helpful to have. Lastly, having staff be more appraised of why the implementation is occurring, and being kept in the loop regarding what IT is working on would lead to a greater level of confidence and understanding when it comes to the update and outage emails that staff members receive.

Accessibility is an area of technology that cannot be overlooked when it comes to employees: if employees are not able to see the data on the screen, they cannot perform their work. The ability to customize font size and colour is important, as it allows those who need

larger text or have an inability to see certain colour combinations to make adjustments to accommodate their needs. The absence of personalization is an oversight that participants have reported to cause undue frustration with Banner 9 and restoring personalization options should be a priority.

Some participants did not know why the Banner 9 upgrade was happening at all. In addition, participants were not entirely confident in the data that Banner 9 was showing them (they would go back to Banner 8 to verify the information frequently) and were unsure if changes they had made were saved. In addition, participants were unsure if they should be reporting all the various concerns and issues that they were having with Banner 9, assuming that IT was already working on fixes, or that they were a one-off error and they would just work around the error.

Participants had difficulty accessing the Banner 9 documentation from the SharePoint website. By having documentation hosted on an unfamiliar platform, users were either unwilling or unable to receive the documentation needed to relearn their tasks efficiently, with all participants having to had relied on Banner 8 being available at the same time to compare and contrast. Participants were unaware of certain functionality in Banner 9 (such as many keystrokes simply changing, not being removed entirely), and this caused frustration with the implementation process.

One participant who was feeling overwhelmed with workload at the time of Banner 9's implementing reported that they were not feeling positive about the change, two participants were neutral about Banner 9, and three participants reported being satisfied or happy with Banner 9. Participants praised the IT department's availability for support as well as their level of assistance given to questions and concerns. Participants stated they enjoyed

the “feel” of Banner 9 more, even though they prefer using the keyboard over the mouse and stated that new users especially will benefit from Banner 9’s intuitiveness and interface.

The closing survey revealed that despite all the concerns and low adoption rates of Banner 9 among participants (pre-mandatory implementation), participants felt optimistic toward Banner 9. Participants reported that Banner 9 took longer to perform tasks, but overall reported that they were satisfied with Banner 9. Nearly all participants reported receiving a satisfactory level of support, and all participants believed they will be just as familiar with Banner 9 as they were with Banner 8. Half of the participants did not list a significant enough concern to repeat after the interviews, but the other half of the responses included the keyboard commands changing, report functionality being missing, and the slow speed being worth reiterating.

The data from the initial survey, interviews, and closing survey provided significant data about the Banner 9 implementation. The initial survey showed us their views on technology, workplace implementations, Banner 9, and concerns they had going into the implementation. In the interviews, participants largely touched on similar areas regarding the implementation. The most common themes found from the compiled data being that users like (or need) the ability to customize colours and font size in applications, users had uncertainty regarding Banner 9 (in both whether their actions were correct and why the change took place), and increased availability of documentation is required for Banner 9. Lastly, the closing survey showed that while participants still thought that Banner 9 was slower and was missing important functionality, they were still optimistic regarding using it going forward and felt that they would over time became just as familiar as they were with

Banner 8. What these results mean, and how the results can be used for future implementations will discussed in the next section.

Discussion

The results from both the survey sections as well as the interviews provided significant data. After examining that data, it was demonstrated that there was a mixture of participants who readily adopted new technologies in their personal lives as well as participants who could be considered technology-averse. This finding was especially highlighted when it came to their attitudes of new technology in the workplace based on their adoption of Banner 9. Specifically, the survey results seemed to indicate that negative attitudes toward any technological implementations were specific to this technological implementation. The interview responses revealed concerns, vis-à-vis the data themes, that participants stated could help improve their attitudes and eagerness to adopt new technologies, as well as ways to improve their regular use of the technology.

Referring to the results outlined in Table 1, Table 2, and Table 3, the collected data seemed to support general findings from the UTAUT and resistance to change. A majority of participants had previously experienced an unsatisfactory implementation of technology in the past and came into the Banner 9 implementation already having this negative experience. While a majority of participants indicated that they do look forward to using new technology, there were participant responses that indicated that some Banner users did not enjoy using new technology, and one participant indicated that they did not fully have confidence in their skills with technology. These responses pointed to a high-likelihood of participants struggling with new technological implementations in the workplace. As evidenced by the 77% of the survey participants who indicated lower enthusiasm when it came to technology

adoption rates in their personal lives, and the 38% of the survey participants who indicated that they had not done any Banner 9 pre-training, there was a high chance that participants would show resistance to adopting Banner 9.

The focus of this research was on how to implement the adoption of technology in an integrative way to minimize any loss of productivity that may result from the Banner upgrade. A way to minimize loss of productivity was to identify recommendations for both the Banner 9 implementation at UNBC and future technological implementations that would reduce the levels of technostress for users and increase the effectiveness and success of said implementations. These recommendations were derived from themes discovered in participant responses that related to resisting adaptation to new technology and methods that could be used to mitigate these issues. A synthesis of the survey responses combined with interview responses revealed the following themes that were present during the Banner 9 implementation: *Personalization*, *Uncertainty*, and *Documentation Availability*.

Personalization. According to Pierce, Kostova, and Dirks (2002), having personalization options available for new technology adoption is imperative. The ability to customize technology according to one's preferences, even if it is something as simple as renaming fields, being able to bookmark favourites, or changing colours, can increase the sense of ownership regarding that technology. This sense of ownership tends to cause users to focus on the positives of the technology instead of solely on the negatives, and also increases the comfort-level of the user, as it is considered familiar to them (Pierce, Kostova, & Dirks, 2002). As Banner 8 had the personalization options such as ability to customize the colour scheme of the application, and UNBC's Banner 9 implementation was missing that functionality, a useful tool in increasing adoption rate was absent alongside it. Participants

did not report the loss of the colour scheme to be significant in their approach to Banner 9, but there were other concerns related to personalization that were reported. None of the participants reported any results that supported the literature's desire for personalization regarding sense of ownership, but instead expanded it as it focused on a different vital aspect of personalization.

Personalization of applications does not just increase sense of ownership for users, but also there are accessibility concerns that can be addressed by personalization, such as ability to see certain colours and font size being too small. As multiple participants remarked on the personalization being missing as a top-concern and the frustration that resulted from difficulty to see, future implementations should strongly consider having this option available. If new technology is too difficult to use, user satisfaction will greatly decrease (Mahitthiburin & Boonkrong, 2015). This aspect of accessibility is critical to user-satisfaction, as it was reported by two-thirds of participants as something that was causing difficulty with their use of Banner 9. The increased difficulty that resulted from harder to see fonts was shown to decrease satisfaction in participants' responses, which is in line with the literature.

In addition, there is an additional detriment to users being unable to personalize their experience: when users are unable to perform personalization, doubt sets in as to whether the personalization function is actually removed, or if the user's skill-level is just too low to perform the personalization (Kirk, Swain, & Gaskin, 2015). Participants who expressed concerns about the personalization did not seem entirely sure if the personalization option was removed, not functioning at the moment, or if the failure was just due to their perceived inability, as Banner 9 did have a personalization area, but no changes to it were allowed to be

saved. As participants did report on the uncertainty of their changes being saved, the immediate doubt that set in on performing one of their first actions in Banner 9 was not a good motivator for adopting Banner 9. The concern reported regarding the inability of users to set personalization and the confusion that resulted supports the documentation of not being confident with new technology, which leads to dissatisfaction.

Accessible documentation. As noted earlier in the chapter, participants struggled with finding Banner 9 general documentation that was digestible and specific documentation pertinent to their role. While some of the documentation that was requested by participants did exist on the SharePoint site, it was clear that participants had trouble accessing the SharePoint site (one participant explicitly mentioned this being an issue). If employees are unable to easily access the information they need, they will go elsewhere (or just give up) when it comes to finding the information (Sangkapreecha & Sangkapreecha, 2012). As participants reported being unfamiliar with using the SharePoint site, having this method to access the documentation can also be considered a new technological implementation. Having two implementations impacting users simultaneously (as far as users are concerned, at least), is a recipe for techno-overload (Khan, Rehman, & Rehman, 2016), which is directly related to decreased job-satisfaction, and has a negative effect on users' intention to use technology (Joo, Lim, & Kim, 2016). This could be seen in participants' responses, specifically in the instance where a participant stated, "I just shut it down, and I didn't have time to deal with it." In this quote, the participant was referring to the difficulty of having to learn Banner 9, and its exacerbation through not easily being able to find relevant documentation. In line with the literature, this participant gave up on the entire learning

process, decided to put off learning Banner 9 as long as possible, and had a negative view of the entire implementation.

If users were familiar with using SharePoint at the start of implementation, new users would likely not suffer from as much techno-overload, as their peers would all be familiar with the system, and users tend to access resources in a similar manner as their peers (Friemel, 2016). For future implementations, it is crucial to ensure that documentation exists in a format that is familiar to users, or at least have available step-by-step instructions/training provided to assist users in accessing documentation so that they are not additionally burdened by struggling to simply access the documentation.

Addressing uncertainty. As multiple users indicated they were unsure of why UNBC was even moving to Banner 9 from Banner 8, and what the differences and advantages were, it may be beneficial for a newsletter of sorts to be distributed alongside future implementations. An increased sense of transparency can reduce levels of resistance to change (Ford et al., 2008). One participant mentioned that users being aware of what is being worked on could cause users who are concerned about a specific aspect feel comfortable knowing that a fix is already on the way. In addition, this could prompt users who have discovered other areas of improvement to suggest them to the IT department, rather than just assuming that the issue is a known one. Another participant mentioned that they had received a large number of outage e-mails since the implementing of Banner 9, and that was causing slight alarm: if an explanation was to why the outages are occurring (that a hotfix is being installed, for example) was provided, the participant stated that users would feel more confident in the stability of the implementation.

If users do not know what the difference in technology is, they may feel as if there is a higher risk in using the new technology and feel dissatisfied that extra effort is required to mitigate the risk of the unknown (Howard, 2011). By not understanding why Banner 9 was required to be browser-based instead of Oracle-based, users may feel that it's change for change's sake, which can be hard to adjust to with competing priorities. As one participant reported "I just need time to go in there myself and look at it… and I just haven't had time." As with techno-overload, techno-uncertainty is also related to reduced job satisfaction.

Chapter Summary

The findings from the participants who took part in this research highlight important areas to consider when performing technological implementations. The survey responses' results aligned well with the expected adoption rate the UTAUT predicted, which reinforced that there was a diverse selection of participants for maximum data collection. The interview portion provided consistent data that was able to produce themes that can be extracted, as well as specific concerns that should be noted for future implementations. The closing survey reiterated this information, as well as highlighted that while staff may not be very eager to adopt new technologies at the start, they do believe that they are capable enough to succeed with new technologies provided the right level of support.

There were no ceiling or floor effects in the survey portion of the interview, with about a quarter to half of the participants scoring less than average on questions. Participants were able to emphasize key areas of concern they had with Banner 9, as well, that were later elaborated on during the interview. Participants reported in the interview that they would like more information regarding the Banner 9 upgrade, they would like more training workshops, and need increased access to documentation. Participants were largely concerned with

missing functionality (namely the ability to print reports), as well as technical issues leading to frustration and uncertainty, the slower speed of Banner 9, and the loss of personalization abilities. Participants stated that they would have liked more time to compare Banner 8 and 9 (for navigation learning purposes), but otherwise reported they were generally happy with the implementation process due to the high level of support available from and provided by the IT department. Lastly, participants reported that Banner 9 has increased user-friendliness and accessibility for new users, and is similar to Banner 8 in practice, which helped with the adoption.

Major findings from the interview included that activities were reported to take longer in Banner 9, but that it was largely due to relearning the system and infrastructure, not extra work, and that they believed that this time increase will not be significant once they are accustomed to Banner 9. Participants were satisfied with the IT departments level of support, that personalization was essential and needed by employees to assist in their daily tasks, that continued training workshops are requested, and that being kept appraised of the IT department's progress regarding the update would be motivating. The closing survey largely echoed the interview findings, with the addition of all participants stating they would eventually be as adept at Banner 9 as they were with Banner 8, either over time or with more training.

Common themes that were taken from the interview findings were that accessibility issues are important, and personalization assists in mitigating concerns related to accessibility. Increasing transparency by providing more information about implementations would give more confidence to users and increase their willingness to adopt the technology sooner. Not having the documentation easily available to users also caused them to have to

teach themselves navigation by comparing Banner 8, but now that Banner 8 access has been removed, users who were slow to adopt have a more difficult time.

Results extracted from the themes show that it would be beneficial to have regular workshops leading to the implementation and continuing after the implementation is complete to allow users increased participation or provide them with specialized sessions. Making sure personalization options are available for all implementations is critical as accessibility issues can prevent employees from performing their daily tasks. Having documentation available to users in a way that is comfortable to them should also be a priority, as if they cannot access it, they start to suffer from overload. Finally, increased transparency can be managed through the use of a regular newsletter to keep employees aware of what is transpiring.

While the implementation is largely regarded positively, there are ways to optimize and improve the implementation. By increasing effort in the areas of accessibility, transparency, increasing access to documentation, and providing more training, user opinion of the implementation, as well as functionality and effectiveness of the implementation can be increased.

Chapter 5: Conclusion

As echoed in this research, technology implementation is commonplace in the workforce and everyday life. As there are significant benefits when employees are more receptive to technological implementations and significant detriments when employees are overwhelmed by the stressors that come with technology, this study of how to mitigate technostress is important for efficiency, productivity, and employee well-being. As UNBC's move from Banner 8 to Banner 9 was a significant change that affected many staff, it was a good example of a technological implementation that could be studied to identify recommendations for smoother future implementation.

Technostress has been shown to negatively affect workers in many ways, affecting job satisfaction, employee health, and productivity (Howard, 2011; Khan, Rehman, & Rehman, 2016; Myrtveit, Jez, & Johansen, 2014). When determining how to mitigate technostress in a technological implementation, it is important to consider how to address resistance to change, include personalization ability for users, and examine strategies that can assist with maximizing implementation efficiency.

This chapter will begin with an overview of the research methodology and a summary of the results of this research. The chapter will then delve into discussion, including recommendations and limitations of the research. The chapter will finally close with lessons learned, as well as what future research in this area might touch on.

Results Summary

As the research was split into two different methods of data collection, when it came to participant data, two different levels of specificity were collected. The quantitative data collected via the surveys provided surface-level information which was useful in identifying

participant views on technology adoption in general. The quantitative data showed that while a majority of participants scored higher on the UTAUT, participants still reported being unsatisfied with previous technological implementation in the workplace and a majority had not taken any steps toward familiarizing themselves with Banner 9. Despite these comments, participants were predominantly positive toward Banner 9 and believed that they would eventually become as familiar with Banner 9 as they were with Banner 8. The qualitative data collected via the interviews provided more in-depth information which was useful to discover how participants felt in particular about Banner 9 and its implementation at UNBC. The qualitative data showed that participants felt that activities took longer than in Banner 8, they were generally satisfied with Banner 9, and they had some specific concerns and suggestions regarding Banner 9. The concerns included that participants felt that the font size/colour was too difficult to see on some forms, the documentation was too difficult to access (for those participants that even knew it existed), and that participants felt largely disconnected from the implementation and were concerned about a lack of transparency. The suggestions to address these concerns included restoring font-size/colour personalization (as existed in Banner 8), increasing access to documentation (perhaps by not exclusively offering it through SharePoint, which staff was not trained on), and increasing the frequency of training workshops and discussions (to keep staff appraised of the features and status of the implementation).

Mitigating resistance makes implementation easier (Ford et al., 2008). Specific concerns were highlighted by the responses of the participants: these concerns provide insight into what participants viewed as important and helpful, and could therefore potentially aid in mitigating resistance. While restoring personalization and missing

functionality was a popular topic with participants, it is likely that this was not an intentional removal of features by the implementation team (a solution for missing reporting functionality was already being worked on during data collection). As such, these two topics will not be included in the Recommendations section. The next section will discuss ways that resistance can be lessened, based on the participant feedback as well as the literature.

Recommendations

There were three major concerns highlighted from participants' responses specifically regarding the implementation of the Banner 9 upgrade. By synthesizing the literature and participants' responses, prioritizing these areas will have a noticeable effect. First, participants expressed desire for training workshops, as there were many features and areas of Banner 9 about which they were curious. Second, a lack of transparency regarding the implementation led participants to have lowered confidence in the upgrade. Finally, the documentation was not provided in an accessible way: most participants either did not know it existed or could not access it easily. In addition, the strategy of cultivating an "opinion leader" seems to be a useful one in this kind of scenario. The following recommendations provide strategies to address these concerns for future implementations.

Recommendation 1 – Further training. In their responses, participants requested the following regarding training: training on learning the major changes between Banner 8 and Banner 9, more frequent training sessions (as workshops took place when they were not able to attend), training on "how to help themselves" (instructing them how to access training videos and documentation), and a "tips and things" session. As participants listed a few different motivations for wanting the training sessions, highlighting sessions that have specific focuses could appeal to different audiences who may not attend a general workshop.

This mirrors findings that employees from different demographics have more benefit from different training styles (Freimel, 2016). Delivering regular workshops on use of new technologies, even after the implementing is completed would be very beneficial for users, as training is shown to reduce levels of technostress as well as increase employees' intentions to use technology (Joo, Lim, & Kim, 2016). This also allows users who were unable to attend (or those who before the implementing did not prioritize attending) workshops further chances to do so. It is clear there is a demand for more training workshops, so an increase in availability would be a positive step in decreasing resistance.

The literature also demonstrated that employees can show improved response to technostress when implementations are coupled with mindfulness-based stress reduction sessions (Myrtveit, Jez, & Johansen, 2014). Separating out "just the IT department doing its job," and providing a space to just focus on group dynamics can potentially mitigate effects of techno-invasion. If a training plan was delivered with these additional considerations of human interaction and interpersonal relations in mind, it might have a positive impact on adoption rates and employee well-being.

Recommendation 2 – Transparency and improved communication. Participants reported not knowing why UNBC was moving to Banner 9, what the technical differences between Banner 8 and Banner 9 were, not being sure of when certain functionality would be coming to Banner 9, and questioned the stability of Banner 9. These concerns could all be mitigated by increasing transparency via increasing communication (Ford et al., 2008). A possible solution to this could be to have a regular newsletter emailed to staff with progress updates, information about the project, and contact information for the Banner 9 implementation staff. In addition, the ability to see what kinds of support tickets for Banner

9 had been submitted by users and successfully closed could also potentially assist with transparency and communication. If there were a way to somehow provide this information to staff and show them that their concerns are being attended to (and to reinforce that they should be submitting tickets), they may be more likely to participate in optimizing the implementation. As users are experts in their own areas, taking advantage of their available knowledge and talent would be beneficial, as this collaboration can lead to better outcomes in technological adoption rates (Summers, 2011).

Recommendation 3 – IT department demonstrations. Separate from the concerns brought forward by participants, it would have been interesting if the IT department demonstrated Banner 9 to staff in general (or even if they have had skilled beta testers recruited from the general user population to test out Banner 9 and provide feedback), rather than have just opened it up to the general staff all at once to let them form their own impressions. By having staff members be invested in the project and speak positively about the implementation, it could make "opinion leaders" who could sway the general opinion on the implementation (Rogers, 2010). These leaders could be either the IT staff demoing Banner 9 to the rest of the staff, or the "testers" who would be heavily involved in Banner and supportive of its success. As staff generally had a negative outlook toward Banner 9 before being forced to use it, it would have been interesting to see if this kind of intervention would have made a difference in early adoption rates.

Recommendation 4 – Accessible documentation. As for the recommendation for documentation availability, there was a comment made by a participant that is very pertinent to technological implementations. The participant mentioned that users were informed that documentation was located on UNBC SharePoint site. However, it appears that users were

not given training on how to use SharePoint itself, and this participant's unfamiliarity with the platform caused the documentation to be out of reach for them: participants who were eventually able to access the documentation spent a significant amount of time doing so. In addition, other participants were also unaware of some pertinent documentation on the SharePoint site (as they mentioned it would be useful to have a specific document that did already exist on the SharePoint site), so it would not be unreasonable to assume that other users had difficulty accessing documentation offered through the platform. The empowerment that can result from providing employees with the ability to help themselves leads to increased motivation, and the documentation being accessible itself would provide the employee with the knowledge required to perform their tasks (Hanaysha, 2016). This empowerment could be addressed by either offering documentation in a more-accessible format (or multiple formats), or by offering training on how to access the documentation via the intended format (less desirable due to potential techno-overload).

These recommendations derived from the participants' data can be used to make future implementation smoother. By increasing training workshops, the effect of decreasing technostress and increasing uptake of the technology in question could occur. By increasing transparency via communication, the effect of increasing confidence in the implementation and higher instances of user feedback could occur. By allowing documentation to be more accessible to staff, technostress would be significantly reduced, and productivity could increase. While recommendations for future implementations were identified via participant response, there were some limitations with this research.

Limitations

Some limitations have been identified with this research. Being a Banner user myself, I may have been unconsciously looking for information that supported my own biases. UNBC is a small research university, and it is possible that the themes might not be representative to other or larger organizations. One of these limitations was that some participants had only used Banner 9 for an extremely limited duration when data collection occurred. Another limitation arose from the Research Ethics Board restricting possible participants allowed to be selected for this research. A possible limitation arose from my being unable to assist participants with any Banner 9-related issues. Finally, a limitation may have been created due to the survey questions themselves.

As I was a UNBC employee at the time of data collection, I played a dual role as researcher/colleague to many of the participants (while there are some participants I had never interacted with before, we were at least familiar with each other's names, as the UNBC community is relatively small). This possibly influenced the questions that I had asked, as well as the responses that I had received (possibly providing more or less information from participant to participant). I attempted to circumnavigate this possible bias by emphasizing my role as a researcher, as well as ensuring participant anonymity.

Before data collection began, some possible limitations for this study were identified beforehand which included the limited experience participants had with Banner 9 and, relatedly, the limited time they had to identify resistances/issues with implementation. This limitation could have been problematic if participants indicated that they had significant trouble with the new interface and required more time to understand how to use Banner 9; however, this would be considered a theme to consider when implementing new technologies

in institutions, and therefore not a limitation that would negatively affect results. Another identified possible limitation was if participants chose to openly resist the upgrade to Banner 9 despite it being a necessary part of their workplace duties, but there were no instances of this being reporting in this study.

During the process to get this research approved by the Research Ethics Board (REB), I ran into some unexpected challenges. Originally, I intended to perform this research in the unit in which I worked, the Office of the Registrar, as there was a high concentration of Banner users that used different forms and had different experience levels. From the REB review, I learned that recruiting participants from this site would lead to an ethical concern, due to a possible perceived power difference between me and the fellow employees in my unit. As well, there was too high of a perceived risk if an employee were to report something that could be self-incriminating, and the data were somehow leaked. For example, if an employee showed an extremely low-level of technological skill/willingness to adapt, the fear was that their employment would be in jeopardy (or at least they would know that I knew this information, and they could feel uncomfortable to continue working with me). Due to this concern, I was not permitted to have any employees participate who were in my unit and was recommended to find participants that were outside of the Office of the Registrar. To avoid further complications, I also excluded staff members from Human Resources, as that could also have been deemed problematic due to the data that they work with. This restriction could be considered a limitation as two major departments that use Banner were not eligible to be participants, so there is the possibility that significant data may be absent from the study.

Another REB concern that arose due to my employment at the institution was that I was originally intending to give Banner support to employees that were struggling (by

coaching them through certain processes or finding literature to suit their specific needs and following up with them). This approach was also not approved, as the university did not want my support to be considered as official support if there was something that went awry, and another instance of perceived power difference. Instead, I was required to direct employees to the IT department if they had any specific concerns and was permitted to supply them with a pre-approved document that had a table showing Banner 8 keystroke commands, and what they now corresponded to in Banner 9. While this is not necessarily a direct limitation of the study, it did change what the study was originally set out to do: by reducing the number of times feedback is received (as the support offered would provide new situation to get data), there may have been themes that remained undiscovered, so this still could be considered a limitation.

Some of the survey questions seemed to lean toward a positive response (without having any negative responses). This could be due to the fact that people felt self-conscious about self-reporting low-levels of skill with (or to a lesser extent, desire to work with) new technology. This can be seen by comparing the question asking about enjoying technology having a few "Neutral" responses, but the ability regarding skill-level only had a single "Neutral" response. The phrasing of these survey questions could have perhaps been worded in different ways to have less of an implication of "being bad at technology" or could have used an additional question worded conversely to reinforce my confidence in the answers (or reveal participants' true opinions). Also of note, the question that asked a statement that was more factual, and less self-reporting, had a wider spread of responses (the question asking about being the last in one's circle to own new technology.

Future Work

As previously mentioned, the small size of the UNBC cautions the generalization of the findings of this research. As UNBC is a relatively small community, it is possible that the conclusions reported are more reflective to UNBC itself, and generalization into other situations might not be possible. Saying that, while this research is specifically in the context of technological implementation at UNBC, the findings may still be helpful in other situations. If more studies of this type are performed at other post-secondary institutions, this research can contribute to the greater literature by having its findings compared and contrasted with the findings of like studies.

When compared and contrasted with like research, it will be possible to determine if the findings reflect outcomes that are not just unique to UNBC itself. Ideally, research will be done that compiles a multitude of studies that compare technological implementations in institutions of like types, as well as institutions overall. If the findings of this meta-analysis support that the findings of this research are generalizable (to similar-sized post-secondary institutions, larger post-secondary institutions, or institutions in general), the findings can be used to increase adoption rates in technology, leading to a more efficient process for everyone involved.

Lessons Learned

If I were to do this research again, I would have done a few procedures differently. I would have rewritten the initial survey questions so that they were more neutral and factual; perhaps referring to how participants felt in events that had already occurred rather than how a participant feels in the present or hypothetical event. The wording of the questions (as discussed in the limitations section), could have led to participants being hesitant to answer a

certain away, and rewording the questions would have made me more confident in the honesty of their responses. I also would have liked to have participants from the Office of the Registrar, but due to the REB restriction, I am not sure how I would have accomplished done so.

As well, if I am being totally honest, I also would have written this thesis a lot quicker. I had a lot of struggles with motivating myself to write while completing it, and if I had just buckled down to do it, I could have finished it at a much quicker pace. Working out a sort of action plan to give myself milestones and deadlines would have been extremely helpful, and I strongly recommend this to anyone approaching writing a thesis: it is far too easy to put it off for the day, and days easily become months.

Summary

Throughout this research, I was unsure if the findings would report that participants' concerns would be: whether it be outright resistance to something changing, being overwhelmed with learning something that looks radically different, or being frustrated with the process as a whole. The research revealed that overall, Banner users at UNBC were willing to adopt new technology, but there were aspects of the implementation that made it difficult: the four recommendations from the research all aim to reduce resistance in adopting new technology.

The recommendation of increasing training and workshop sessions for users before and after the mandatory go-live date would likely reduce technostress and increase willingness to adopt new technology. The recommendation of increased transparency (by increasing communication to users) would allow users to feel more confident in the implementation as well as understand the purpose of why the implementation is occurring.

The recommendation of making documentation more accessible would allow users to use the technology easier, more readily, and decrease the strain on support (as they would be able to learn functionality on their own). If "opinion-leaders" were created from select Banner users, opinion of the implementation could also have improved.

This research did have limitations, as I expected my dual role as a researcher/Banner user on campus to be an advantage in performing this research, but due to potential biases and REB restrictions, it actually hindered my ability to collect data. The restriction of my participant population caused a large section of Banner users to be ineligible, and I was not able to provide Banner 9-related support to any of the participants. The choice of wording in some of the initial survey questions could have potentially skewed initial survey responses, and my experience as a Banner user could have shaped some of the questions of the survey. While this research is specific to UNBC, this only cautions against generalizing it to others: combined with other research in future meta-analysis, these findings have the possibility of repeating elsewhere.

It is important to consider the users during technological implementations for institutions. Implementations of new technology are becoming more and more commonplace, and the stigma surrounding them needs to be addressed to help them run more efficiently. Combined with like research, this research has the potential to contribute to technological implementations in a more generalized setting. In doing so, implementations can look to these findings for suggestions on how to mitigate technostress, leading to improved employee well-being, increased feelings of employee empowerment, acknowledgment of employee voice, and ultimately increased chances of positive and successful technological implementation.

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Appendices

Appendix A: Sample Initial Survey Questions

1) I feel anxious using computers.

Strongly Disagree Disagree Neutral Agree Strongly Agree

2) I enjoy using new technology.

Strongly Disagree Disagree Neutral Agree Strongly Agree

3) I am confident in my computer skills.

Strongly Disagree Disagree Neutral Agree Strongly Agree

4) I am comfortable using technology.

Strongly Disagree Disagree Neutral Agree Strongly Agree

5) I'm usually the last in my circle to own the latest technology.

Strongly Disagree Disagree Neutral Agree Strongly Agree

6) Can you think of time where you were previously unsatisfied with an upgrade in the workplace?

No Yes

7) Have you done any pre-training regarding Banner 9 (such as watching videos)?

No Yes

8) Have you already used Banner 9?

No Yes

8a) If Yes, please list one problem that you have struggled with in Banner 9:

9) What is your age?

20 or Under 21-30 31-40 41-50 51-60 61-70 70+

10) What is your gender?

If you are willing to participate in the interview portion of this study, please select Yes. This will give up your anonymity (to the researcher only), but the responses will be still kept confidential.

No Yes

Please provide a contact e-mail address for the researcher to follow up with if you are selected for the interview portion of the interview:

Appendix B: Sample Interview Questions

Time Spent

1) What activities take longer in Banner 9?
2) How much longer does it take, on average?
3) What is it about that activity that causes it to take longer?

Satisfaction

1) How does Banner 8 compare to Banner 9?
2) What aspects of Banner 8 do you prefer, if there are any?
3) What would make it easier to perform your tasks in Banner 9?
4) What can be done to support you more with regards to Banner 9 training?

Suggestions and Concerns

1) What inconveniences have you found with the new version of Banner?
2) What is the most challenging part about Banner 9, if any?
3) What is the least challenging part about Banner 9, if any?
4) If one comes to mind, please list one problem that you have struggled with in Banner 9.
   4a) On your survey, you indicated a problem with…please elaborate.
5) Is there any area or aspect of Banner 9 that you would like more training on?
6) Do you have any other questions or concerns you would like to share regarding this project?

Appendix C: Sample Closing Survey Questions

1) How do you feel about the Banner 9 upgrade?

Concerned Slightly concerned No opinion Optimistic Excited

2) Has there been any change in how long it takes to perform your daily tasks?

Much slower Slower No change Faster Much faster

3) How do you find Banner 9's usability compared to Banner 8 (the previous version)?

Very difficult Difficult About the same Easier Much easier

4) How satisfied are you with Banner 9?

Not at all satisfied Slightly unsatisfied Neutral Satisfied Very satisfied

5) I feel supported with the Banner 9 training I am receiving.

Not at all Unsatisfied Acceptable Satisfied Very Satisfied

6) Over time, do you believe that you will be just as familiar with Banner 9 as you were with Banner 8?

No Yes

7) With extra training, do you believe that you will be just as familiar with Banner 9 as you were with Banner 8?

No Yes

8) Please list one problem that you have struggled with in Banner 9:

[_____]

Appendix D: Information Sheet and Consent Form for Participants

UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

Information Letter / Consent Form

January 2nd, 2019

Banner 9.X Upgrade Adaptation MEd Student Study

Project Lead: Aron Horvath
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Project Supervisor

Dr. Andrew Kitchenham (andrew.kitchenham@unbc.ca or 250-960-6707)

Purpose of Project

To discover what common themes are present at UNBC when it comes to adaptation and resistance to new technology, and what methods can be used to mitigate these issues. This research will be the basis of the project lead's Master of Education thesis. This is a separate and independent activity from the actual Banner 9 upgrade. An impact of this study directly related to the university would be that areas of struggle with the new Banner system will be identified so that, later on, further training, troubleshooting, or potentially modding can occur to assist with ease of using the Banner software in daily tasks. All Banner users are invited to participate in this research, with the exception of Office of the Registrar and Human Resources staff.

What will happen during the project?

The researcher will survey you with questions related to you and adaptation of technology. This will consist of one short (approx. 5 minutes) electronic survey via Survey Monkey for all participants, and, if selected for further study, you will be asked to complete three more short surveys as well more in-depth questions in two separate interviews (30-90 minutes each). All data will be collected in your own time and not during work hours. Please do not be concerned with voicing any resistances to the upgrade; these resistances show a level of commitment and evaluation and are useful to the researcher. If you are selected for the 30- to 90-minute interview portions, the researcher will discuss with you any inconveniences or roadblocks you may be encountering during the rollout of the new version of Banner as well as any strengths of Banner 9. Working together with the researcher, you will together identify any points of hardship, which the researcher might include in his thesis recommendations, ensuring that the source of the recommendations is never identified. Notes will be taken regarding these interactions that you can request to view, audit, and add/remove at any time. Participating in this research gives you the opportunity to share any concerns or strengths you have with the Banner upgrade; however, those concerns will not be shared with anyone else and no direct assistance will be provided by the researcher. If a staff member chooses not to participate in this project, he or she can still share concerns with his or her supervisor through the proper channels.

You are being invited to take part in this research study because I want to learn more about how to help people adopting a new piece of technology, such as the Banner 9.X upgrade, by ascertaining where the stressors are in such an implementation. As one of the people who is responsible for that implementation, you are a data-rich participant.

Risks or benefits to participating in the project

If you are selected and consent to participate in the interview portion of the study, please note that this will take place on your own personal time, not during work hours. There is the possibility of a social risk: by participating in this study as it is possible that your coworkers may know of your participation in this study; however, participating outside of work hours should ameliorate this risk and the researcher will ensure that you are interviewed away from your work area and possibly off campus depending on your venue choice. By participating in the interview portion of the study, you do give up your anonymity to the researcher only (as he will need to be able to contact you), but your responses still remain confidential and will be anonymized.

A major benefit of this study will be the opportunity for UNBC employees to share their concerns, challenges, struggles, tips, tricks, and so forth that could be shared in the thesis in anonymized format.

Confidentiality, Anonymity and Data Storage

Collection of data will adhere to ethical treatment. The survey data will be collected through the Survey Monkey service, with the interview portions of the study also being audio-recorded. Interview responses will be typed in by the researcher after the data has been retrieved. Audio recordings will be deleted after they have been transcribed, and the transcripts will be deleted once the project is complete. All other data will be kept confidential and offline on a password-protected computer in the researcher's home office and will be kept for 7 years after successful thesis defense. The researcher will be the only one with access to this raw data; however, his supervisor may see transcribed, anonymized transcripts (i.e., no name, gender, age, workplace department) to check for accuracy in coding and theming of the data. Once the survey data and interview data are linked together, all the data will be anonymized to no longer have personal information attached to it.

As this is a qualitative study specifically for UNBC, it may indeed be impossible to guarantee anonymity. The work environment, and number of potential participants will make it possible that coworkers are aware of an individual's participation as a UNBC employee. However, it would be rather difficult to pinpoint exactly what information came from which individual, as the projected information will be concerned with the themes of technostress and technology adoption, not the specific technical areas of Banner.

Study Results

The results of this study will be reported in a graduate thesis and may also be published in journal articles and books, and/or presented at academic conferences. The anonymized results may also be reported to the Provost with respect to themes present and areas of improvement noted when it comes to implementing new technology but only upon his request. If participants are interested in receiving a copy of the thesis, they are welcome to contact the project lead who can provide a summarized version of the results directly or provide information on where to retrieve the thesis after the research is completed.

Participant Consent and Withdrawal

Taking part in this study is voluntary. You have the right to refuse to participate in this study without any negative impact on your employment. You do not have to answer any questions that make you feel uncomfortable. If you decide to take part, you may choose to withdraw from the study (and have any data collected from you destroyed and removed from the study) at any time without any negative impact on your employment and without giving a reason.

Questions or Concerns about the project

If you have any questions about this research, please contact the Project Lead: his name and telephone number are listed at the top of the first page of this form. If you have any questions about the conduct of the research, please contact the Research Ethics Board at reb@unbc.ca or 250 960 6735.

CONSENT

I have read or been described the information presented in the information letter about the project:

YES NO

I have had the opportunity to ask questions about my involvement in this project and to receive additional details I requested.

YES NO

I understand that if I agree to participate in this project, I may withdraw from the project at any time up until the report completion, with no consequences of any kind.

YES NO

I have been given a copy of this form.

YES NO

Signature (**or note of verbal consent**): _____

Name of Participant (Printed): _____

Date: _____